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Scientific journals, networks, flows and metrics: reflections and their implications for the field of Education

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Abstract: This article offers a theoretical reflection on the transformations reshaping the production, circulation, validation, and construction of scientific knowledge within the informational paradigm. It departs from the assumption that technological innovation, articulated with systems of academic measurement and evaluation, reorganizes scholarly communication and confers centrality upon journals not merely as recording media, but as structuring elements of this ecosystem. The article first examines the historical process by which journals consolidated and became embedded in global networks of knowledge circulation. It then discusses the role of these publications in the construction of academic reputation and in the mechanisms of legitimation of scientific production. Finally, it addresses the dynamics of metrics and research evaluation systems, contemplating the specific area guidelines established by CAPES for the evaluation of Master's and PhD Programs. highlighting their limits, tensions, and effects on editorial practices and academic trajectories. It is argued that this set of processes directly shapes the organization of scholarly communication and the social and institutional conditions under which knowledge is recognized.
Keywords: scientific communication; scientific publications; scientific journals; network society; bibliometric indicators.

1 Introduction

The capacity of societies to master or not the strategic technology of their time directly influences their development. Although technology alone cannot determine social transformation nor historical evolution, it carries the potential to modify societies' structures, depending on how it is used within a context of collective struggles and choices. The society that emerges from such transformations is simultaneously capitalist and informational, characterized by speed and flexibility; yet with significant variations across countries, according to their historical, cultural, and institutional trajectories, as well as their relationships with global capitalism and information technologies (Castells, 1999).

It is within this scenario that questions such as “will digital books replace printed ones?” or “will virtual libraries replace physical ones?” arose, gaining traction especially at the end of the twentieth century, within a context of transformation of the means of production and circulation of information. These changes are related to what Castells (1999) calls the “network society”, in which information technologies are central to social organization and an informational influx predominates, interconnected on a global scale. In this scenario, it is not a matter of directly replacing media or institutions, but rather of reconfiguring them in response to new forms of access, mediation, and information use.

This perspective moves away from readings based on the idea of rupture or radical disappearance of previous media, according to Levy’s questioning (1996, p. 50): “Does the multiplication of screens announce the end of writing, as certain prophets of doom suggest? This idea is most likely mistaken.” The author draws attention to the fact that digital technologies do not eliminate consolidated cultural practices; they reinscribe them in new communicational environments, producing continuity, displacements, and recombination.

Such a historical dynamic is not unprecedented. When analyzing the transition from manuscript to print, the printing press did not constitute mere technical innovation but an event that reconfigured the means of information circulation and the process of institutionalizing knowledge (Burke, 2003, 2012). Material transformations in media, therefore, reorganize intellectual practices and alter the ways of social circulation, without implying a simple substitution of previous structures.

Over time, reality has shown that, far from being replaced, print books and physical libraries have undergone a process of adaptation and coexistence with new technologies. This reconfiguration movement has not been restricted to traditional reading media; it has also reached the pillars of scientific communication. Among them, scientific journals stand out, having experienced transformations with the digitalization and rise of network technologies, taking over a strategic role in the organization, validation, and circulation of academic knowledge.

Scientific journals are “[…] a collection of scientific articles written by different authors […] gathered at regular intervals and distributed under a single title” (Meadows, 1999, p. 7). While books are traditionally associated with in-depth, long-term

compilations, journals stand out for their dynamic nature, serving as a privileged means for the rapid circulation of new discoveries and academic debates.

With the transition to the digital medium, journals have not only expanded their reach and accessibility but also become part of a more integrated macrosystem, where databases and impact metrics play strategic roles in validating and disseminating knowledge. Thereby, discussing media alone or technological replacement is not enough, since the digital constitutes a change in the communication ecosystem, not just a media shift, shaping new ways of thinking (Santaella, 2003, 2013).

In the context of interconnectivity and the ongoing circulation of knowledge, scientific journals align with the logic of the Network Society and the Information Age, as discussed by Castells (1999). From its origin, these publications were conceived as instruments to register and communicate discoveries swiftly, allowing research results to circulate rapidly among peers, a condition considered essential for the continuous advancement of science (Meadows, 1999). In the digital scenario, such speed has become even more crucial, consolidating journals as fundamental components in the dynamics of globalized science.

The centrality of scientific journals is not limited to mediating academic communication; it is also intertwined with contemporary forms of regulation and evaluation of scientific production. In a context of expanding graduate programs and intensifying policies for measuring academic performance, journals have come to operate as structuring devices for what is published, how it is published, and what is recognized as valid knowledge. The transformation of media, therefore, connects to the consolidation of a scientific environment guided by evaluative criteria that reconfigure research, writing, and knowledge circulation practices.

This position of the journals, however, is not without its critiques. Waters (2006), for example, reflects on the evaluative and productivity-driven logic that reorganizes academic practices and criticizes the metrics-based reputation economy. According to the author, such a dynamic tends to favor fragmented, rapid, and quantifiable forms of publication, displacing, even if indirectly, the role of books, whose production traditionally involves more time for elaboration and intellectual maturation. The author does not propose an opposition between formats but warns of the effects of an evaluation model that starts to guide the very dynamics of scientific communication.

Far from dichotomous or deterministic perspectives, this article proposes a framework for reflecting on the transformations that have been reshaping the production, circulation, validation, and, consequently, the construction of knowledge, with particular attention to the dynamics within the education field and its specific ways of producing, communicating, and legitimizing knowledge, especially at the graduate level. It is based on the understanding that technological innovation, combined with systems of academic measurement and evaluation, reorganizes scientific communication and grants centrality to journals as constitutive elements of the informational paradigm, rather than merely as media for recording knowledge.

2 Scientific journals in the national and international academic environment

Philosophical Transactions, launched in March 1665 under the Royal Society's management, is considered the first and oldest scientific journal in the world still in operation (Royal Society, 2025). From the same period are the *Journal de Savants* (1665), *Giornale de'letterati* (1668), *Acta Eruditorum* (1682), and *Nouvelles de la République des Lettres* (1684), among other journals created to facilitate the dissemination of different forms of knowledge among scholars (Burke, 2003). In Brazil, the first journals were the *Gazeta Médica do Rio de Janeiro* (1862) and the *Gazeta Médica da Bahia* (1866), both publications in the field of health (Souza, 2006).

Over the following decades, the editorial industry underwent a continuous process of expansion (Hernandez Vásquez, 2015), which intensified in the post-World War II (Guanaes; Guimarães, 2012) and gained further momentum with the so-called information explosion (Meneghini, 2012), consolidating scientific journals as key instruments for academic communication and the advancement of science.

This process of expansion led journals to progressively broaden their influence, moving from publications restricted to scientific societies to communication channels with national and international reach. In doing so, they were consolidated as fundamental instruments for the continuous dissemination of knowledge, as scientific communities developed and intellectual exchange across different contexts was fostered. Therefore, scientific journals not only document the progress of science but also strengthen global knowledge networks, as information and communication come to occupy a structural position in the organization of contemporary societies (Castells, 1999).

This function of continuous knowledge dissemination, which accompanied the consolidation of scientific communities since the seventeenth century, is reconfigured when digital technologies begin to reorganize the modes of circulation and access to information. In this process, it is not a matter of simply replacing the previous media formats, but rather transforming practices of writing, reading, and intellectual production, as Lévy (1996) argues, when analyzing the virtualization of the text and the multiplication of forms through which knowledge is inscribed.

Although initiatives to computerize editorial processes had existed since the 1970s, it was from the 1990s, with the consolidation of internet use, that the change intensified, initially maintaining the print format and fostering a hybrid publishing model (Boyce; Dalterio, 1996; Gruszynski; Golin; Castedo, 2008). This movement not only expanded the reach of publications but also integrated them into the logic of the Network Society (Castells, 1999), in which information circulates in a decentralized, rapid, and interconnected manner.

From this perspective, journals come to operate as informational nodes that integrate increasingly interconnected flows of scientific communication. In the digital era, journals cease to be merely channels of communication and assume a strategic position within this network of knowledge production and sharing, fostering new forms of interaction among researchers and greater dynamism in academic debate, insofar as, as Castells (1999) observes, the circulation of information is organized primarily through networks. As these flows intensify, academic visibility and recognition begin to depend on the insertion of journals and their contents into global circuits, where the production, access, and legitimation of knowledge are articulated.

This technical and communicational reconfiguration has direct implications for the organization of the scientific community itself. The technological evolution and the expansion of digital access introduced, for those who published in journals, the logic of global academic networks, based on the assumption of a scientific communication in which peers are no longer situated within the same institution, region, or country. In this sense, it is not only a change in technical media, but the reconfiguration of ways of social organization, in which communication and information come to shape the institutions themselves (Castells, 1999).

In such a context, expanding the reach of publications and incorporating previously distant interlocutors becomes a central component of the editorial practices.

Since the composition of editorial boards to the affiliation of authors, and including the body of reviewers, the diversity of institutions, regions, and overall, of countries becomes a qualification factor, and the representativity of these affiliations comes to be understood as an indicator of legitimacy, institutional recognition, and credibility in the circulation of knowledge.

This orientation can be observed in the admission criteria of the Scientific Electronic Library Online (SciELO, 2024), according to which the evaluation of a journal's editorial qualification takes into consideration the diversity of authors' origins as well as the composition of the editorial board, considering its international distributions and the diversity, equity, and inclusion principles, aside from considering the distribution of affiliation of the published articles as an indicator of representativeness, scope, and diversity of the journal's presence, and, therefore, of its relevance. In this sense, as Castells (1999) argues, networks are not neutral spaces: they operate according to criteria of inclusion and exclusion which define positions, visibility, and forms of recognition.

At the same time, these criteria begin to guide the publication strategies of researchers themselves, who increasingly seek to place their work in journals that are already recognized and internationally indexed, insofar as such inclusion expands visibility, reach, and legitimization of their productions. The internationalization of scientific communication through journals has been driven primarily by information technologies; however, the demands of internationalizing academic production are also grounded in the expansion of peer validation. In this scenario, not only institutions and the indexation system start to "program" the circuits of knowledge, with editorial teams reorganizing accordingly, but authors themselves increasingly direct their submissions to journals indexed in databases such as Scopus, Web of Science, Latindex, SciELO, Redalyc, among others.

This dynamic constitutes an articulated movement within scientific communication. Digital Technologies reconfigure the means of production, circulation, and validation of knowledge, while databases and systems of indexation translate these transformations into formal criteria of qualification and recognition. Journals, on the other hand, adjust their editorial practices and requirements, while authors increasingly seek precisely these venues, as their inclusion in international circuits amplifies the reach, visibility, and legitimacy of their research. Therefore, it is not a

matter only of a “top to bottom” imposition made by evaluation systems, not of a purely spontaneous movement of researchers, but rather a feedback loop that continuously reshapes the very dynamics of scientific communication.

This same process, however, also produces tensions and asymmetries, especially for authors and journals situated within national contexts or attached to regional agendas, for whom insertion into global circuits does not always occur under symmetric conditions. Authors face difficulties related, among other factors, to the predominance of English and funding constraints.

As far as language goes, the consolidation of English as the lingua franca of science, while expanding the international circulation of academic production, also generates exclusionary effects, whether by imposing additional barriers on researchers from non-English-speaking countries or by the economic and symbolic costs involved in adapting to this standard (Fortes, 2016; Tennant *et al.*, 2019). It is, thereby, not only a communicational matter, but a dynamic permeated by power relations, through which positions of centrality and periphery, visibility and silencing, are defined within the international scientific system (Ortiz, 2004; Santin, 2019).

Regarding funding, many journals operate under the Article Processing Charges (APCs) model, which requires the payment of high fees for the publication of articles, making it difficult for the participation of researchers from countries, institutions, and fields with fewer resources, a reality already noted by Meadows (1999) and still relevant today (Albuquerque, 2025).

Some initiatives tried to reduce these barriers, such as transformative agreements established between the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES)[1] and international publishers, such as Wiley Online Library, the Institute of Electrical and Electronics Engineers (IEEE), and the American Chemical Society (ACS), which allowed researchers to publish in open access, with publication fees funded by CAPES (CAPES, 2024b). The counterpoint to these agreements is that, although they help authors individually, they maintain the economic logic of major commercial publishers by combining subscriptions and publication fees. As Limongi (2026) observes, this model entails the continuous transfer of public resources to a concentrated publishing market; it also diverts investments from well-

[1] *Brazilian Federal Agency for Support and Evaluation of Graduate Education*, also known abroad as CAPES Foundation.

established non-commercial initiatives in Latin America, such as SciELO, which operates under the diamond open-access model.

From the perspective of journal publishing, there are challenges to the production of knowledge disseminated in national journals, especially considering the limits and possibilities of internationalization. Journals whose scope focuses on regional or cultural topics, for example, often face barriers in this globalized landscape. Although the internationalization of science is part of a wider movement, as previously mentioned, it is not reasonable to neglect or weaken initiatives that strengthen local scientific identity in favor of a standardized, homogenizing norm. Bearing this in mind, competition for space in high-impact journals has intensified, particularly in a scenario where editorial power is concentrated in large international conglomerates.

In summary, the integration of journals into the informational paradigm and the logic of global networks transforms these publications into strategic nodes of scientific communication, shaped by dynamics of circulation, visibility, power, and inequality. At the same time that they amplify the reach of scientific production, these circuits also reconfigure the legitimation mechanisms and academic recognition, creating tensions, asymmetries, and disputes over visibility. It is within this context that journals stop being merely channels of dissemination and come to play an active role in validating knowledge, constructing scientific prestige, and organizing academic hierarchies; dimensions that will be further explored in the following section.

3 Scientific journals, academic legitimization, and reputation

The reflections previously discussed reinforce the idea that the essential function of the scientific journal is to actively contribute to the construction and the global circulation of knowledge. In this sense, they also play a central role in the visibility and credibility of researchers, serving as platforms for validating and disseminating academic knowledge.

Over time, it has been observed that publishing in recognized journals not only confers legitimacy on a researcher’s work but also expands its reach within the scientific community. This centrality of scientific communication in the process of knowledge construction is summarized by Meadows (1999, p. 7), who states that “Communication lies at the very heart of science. It is as vital to it as research itself, for

research cannot legitimately claim this name until it has been analyzed and accepted by peers."

Journals are not only vehicles for publication but also central agents in the construction of academic prestige and in integrating researchers into the circuits of knowledge production, ensuring visibility, recognition, and credibility. (Corera-Álvarez; Molina-Molina, 2016; Ruiz-Corbella, 2018). They are not limited to communicating discoveries; they play an active role in shaping scientific reputation, positioning themselves as key actors in the symbolic economy of science (Ruiz-Corbella, 2018).

Moreover, journals serve as credentialing devices, establishing methodological and ethical standards for scientific publication and acting as gatekeepers[2]. As Meadows (1999) highlights, this designation evokes the image of someone who positions themselves among the flow of information, selecting, validating, and granting visibility to the work of researchers. Thus, by submitting an article to the editorial process of a journal, scholars not only expose their ideas to the scrutiny of the scientific community, but also seek the symbolic mark of quality that journals offer, even if, returning to Castells' (1999) perspective, these process of selection and validation are not neutral, since networks operate according to logics of inclusion and exclusion that define positions, visibility, and forms of recognition.

A journal's reputation is built on several factors that ensure its credibility and relevance within the academic community. Among these, key elements include the composition and internationalization of the editorial board; the adoption of ethical guidelines, fundamental for ensuring the reliability of publications; the indexation in recognized databases and the associated metrics, which will be discussed in the next section; as well as the peer-review process, one of the cornerstones of this system.

In general, peer review strengthens the integrity of the academic literature by preventing the dissemination of inaccurate or low-quality information. The role of journals as instances for filtering and organizing knowledge is inscribed in a long history of forms of circulation and information control, as Burke (2003) shows in analyzing the institutionalization of systems of knowledge communication. The tradition of this process dates to the early years of scientific publication, as evidenced by the

[2] "Influences opinions, restricts and disseminates information and facilitates cultural adaptation in different ways; information aggregator, information catalyst, information gatekeeper, technological gatekeeper, information hub, technological sentinel" (Cunha; Cavalcanti, 2008, p. 282).

Philosophical Transactions in 1665, which required texts to be reviewed by its members and approved by the Council prior to publication (Meadows, 1999).

In the editorial process, manuscripts are assessed based on criteria such as originality, relevance, quality, and adherence to the journal's guidelines (Barata, 2019), as well as scientific rigor and thematic relevance (Hernandez Vásquez, 2015). In this context, peer review serves as one of the primary mechanisms for validating scientific work, both by filtering out submissions with weaknesses and by helping improve texts through reviewers' feedback (Horbach; Halffman, 2020); even though this process faces increasing pressure due to the rising number of submissions and because reviewers, mostly, perform this task alongside other academic duties, dedicating only a limited amount of time to it (Tarragó, 2022).

As a result of this process, the journal's and the researcher's reputations reinforce one another: the journal's institutional credibility legitimizes the content it publishes, while that content, once validated, contributes to the construction of the authors' academic prestige. At the same time, peer review strengthens the reliability of science and advances knowledge by allowing discoveries to be continuously refined, replicated, and expanded. In this context, the role of the reviewer is central to the integrity of the journal, as it is through their evaluations, guided by editorial guidelines, that the process of validating and qualifying scientific production is carried out effectively.

The reliability and integrity of journals are also expressed in the transparency of the editorial management. Practices, such as the dissemination of submission, review, and acceptance dates, allow the academic community to evaluate the journal's efficiency in handling manuscripts, fostering greater trust and predictability. This is also linked to the timeliness required in digital publishing and to the criteria established by indexing databases, such as SciELO (2024), which recommends a maximum period of six months between the submission of an article and its publication.

Although the current requirement to present submission and acceptance dates is more closely associated with editorial control policies and average processing time, the origin of this practice lies in claims of originality and priority, which have always been crucial in the publication of discoveries. As Meadows (1999, p. 12) points out, "The appearance of the date of receipt of the manuscript in the article reflects the scientific community's desire to be able to decide on claims of priority." In this way,

journals also serve as instances that guarantee intellectual property and legitimize new fields of study (Gruszynski; Golin; Castedo, 2008) and are directly influenced by the academic trajectories of the researchers (Ruiz-Corbella, 2018).

Taken together, these elements make evident that scientific journals do not operate only as channels of dissemination, but as central devices for validation, organization, and hierarchization of knowledge, where editorial criteria, review practices, and mechanisms of recognition converge. By legitimizing content and simultaneously conferring prestige on the authors, journals come to occupy a strategic position in the dynamics of scientific production, shifting the debate beyond technical transformations and publication formats. This centrality, however, also extends to the ways in which the academic production is measured and classified, as processes of recognition increasingly become embedded in formal systems of metrics and indicators.

4 Journals, metrics, and evaluation of intellectual production

Up to this point, the reflections presented concern the consolidation of scientific periodicals as central instances of knowledge validation, a process that has brought with it an increasing centrality of evaluation systems, impact metrics, and citation indices in the organization of academic life. These instruments have come to play a decisive role not only in the qualification of journals, but also in the recognition of research and in guiding researchers' own choices, significantly influencing the dynamics of scientific production.

A fundamental aspect in the evaluation of scientific journals is the standardization of criteria that allow measuring their influence in the academic field. To this end, several metrics were developed to provide a more objective overview of publication relevance. These indicators not only assist researchers in choosing the most suitable journals for disseminating their studies but also guide academic institutions and funding agencies in defining scientific policies. In this way, they structure visibility and recognition within scientific networks, as Castells (1999) argues, networks not only connect but also organize positions, hierarchies, and unequal access to prestige and information circulation.

In this sense, the qualification of scientific journals, beyond their editorial boards and institutional affiliations, is closely linked to factors such as indexing and metrics.

Indicators like Impact Factor[3], H-index[4], CiteScore[5], and other ranking systems are widely used. In this context, countries adopt their own evaluation systems, tailored to their specific institutional and academic characteristics.

In Brazil, the need to evaluate the scientific production of graduate programs dates to the 1970s, with the beginning of CAPES' assessment of graduate programs in the country, using indicators that have evolved over time and culminating in the creation of Qualis Journals in 1998 (Barata, 2016; Closs, 2002; Capes, 2024c).

The creation of Qualis Journals aimed to indirectly qualify the intellectual production expressed in scientific articles, based on the evaluation of the quality of the journals where these works are published. As a result of this process, classificatory lists of the journals used by graduate programs to disseminate their research were made available over the four-year period (Capes, 2023).

Over the years, the classification has undergone adjustments and reformulations. This process made tensions between the original purpose of Qualis and its actual uses evident, as the system came to operate as a quality reference to journals, influencing editorial decisions, guiding publication strategies, and impacting institutional policies related to career progression, faculty accreditation, and de-accreditation (Barata, 2016).

In view of these and other factors, CAPES announced the end of Qualis as the result of the evaluation of the intellectual production in graduate programs (CAPES, 2024a; CAPES, 2025a). In its place, it proposed, as an alternative, the adoption of a model that prioritizes metrics aligned with international standards, which, while not directly disconnected from the journal, shifts the focus to published articles and opens the possibility of an evaluation, also qualitative, of these works (CAPES, 2025a). The change aims to improve the evaluation of graduate programs in Brazil, seeking to

[3] "The impact factor, or *Journal Impact Factor* (JIF), is a numeric indicator that evaluates, ranks, categorizes and compares the indexed publications in the WoS [Web of Science]. It measures the influence, importance, and relevance of a publication through the analysis of citations, thus assessing its impact within its respective scientific field." (Universidade Européia, 2026).

[4] "It is an indicator proposed to quantify the number of citations of the most cited articles of each scientist and researcher, evaluating their productivity and impact. It is currently adopted to evaluate not only researchers, but also universities, research groups, and scientific journals." (UFMG, 2017).

[5] CiteScore is a bibliometric citation indicator calculated from the Scopus database. It measures the impact of scientific journals by showing the average number of citations that a journal's documents receive during a four-year period, considering both citations and documents published within the same interval (Elsevier, 2026).

reduce distortions and ensure greater recognition and impact of Brazilian academic production (CAPES, 2024a, 2024c, 2025a).

Metrics integrate the context of validation and qualification of scientific production; after all, they can provide indicators of a study's impact and relevance within the academic community. Meadows (1999) argues that the quality of research can be evaluated by the level of interest it generates in the academic community. One of the most common methods for measuring interest is analyzing the number of citations a study receives in subsequent publications. However, the author emphasizes that this type of evaluation requires caution, since research can be cited for various reasons, not always related to its scientific relevance.

Within this context, for example, Santos-D'Amorim *et al.* (2023) investigated the persistence of citations to retracted scientific articles and their impact on the academic community. The study identified that 75.8% of citations in retracted articles were neutral, meaning that they mentioned the articles without judgment of their validity, while 23% were positive citations and only 1.2% were negative. For the authors, this situation raises questions about the integrity of the scientific literature, especially in sensitive fields such as the Health Sciences, and reveals problems in citation practices, suggesting that impact metrics can reproduce these distortions.

Such a dynamic fuels a debate over whether quantitative metrics alone can fully reflect the quality and originality of a study. These indicators may be influenced by several factors, such as the field of knowledge, the language of publication, and the journal's visibility and origin, leading to distortions in scientific evaluation. This dynamic reinforces, as Santin (2019) points out, the predominance of a science model oriented by mainstream science parameters, in which metrics and indicators tend to reproduce already established disciplinary, linguistic, and geopolitical hierarchies.

The Impact Factor, for example, although widely used, has been criticized since the 1990s for its methodological limitations and susceptibility to distortions, as the high citation of a few articles can artificially inflate a journal's indicator (Tennant *et al.*, 2019). Furthermore, its uncritical use tends to equate the journal's prestige with the quality of individual works, under-represent fields such as social sciences and humanities and research from peripheral regions, and marginalize studies in local languages and regional topics, incentivizing questionable practices of authorship and

citation practices, reinforcing a reputation logic based more on editorial prestige than on the substantial quality of research (Tennant *et al.*, 2019).

Citation indices and other bibliometric indicators do not reflect differences across fields of knowledge and geographic regions in a balanced way, although they are widely used in the formulation of scientific policies, the evaluation of academic merit, and funding decisions (Santin, 2019). While useful for mapping scientific activity and impact, these metrics do not capture multiple dimensions of knowledge production, which calls to qualitative and complementary approaches (Santin, 2019).

Furthermore, citation metrics may not be immune to fraud and manipulation. Paper mills, the use of bots, algorithms programmed to inflate citations artificially, and questionable practices such as citation circles can compromise the reliability of the data, making it less representative of a study's actual influence.

Circling back to the issue of the guidelines set by CAPES (2025a) for evaluating scientific production from graduate programs in Brazil, there appears to be some progress in including the possibility of a qualitative assessment of the works. However, the quantitative logic of metrics still remains the starting point, which distances the country from initiatives such as the Leiden Manifest (Hicks *et al.*, 2015) and the San Francisco Declaration on Research Assessment (2012), both of which highlight the limitations and risks of treating bibliometric indicators as synonymous with scientific quality.

From this perspective, the evaluation models not only reflect the organization of science but also actively participate in its governance by defining criteria of visibility, recognition, and circulation in scientific networks that, as Castells (1999) reminds us, are structured by logics of inclusion, exclusion, and hierarchization. In this way, the centrality of criteria for evaluating the scientific production and the pursuit of a balance between traditional metrics and qualitative indicators are as relevant as the debate over access routes to information and scientific production. The democratization of knowledge necessarily involves expanding the means of disseminating and accessing scientific articles, ensuring that research results reach the widest possible audience, within and beyond academia.

In summary, the discussion presented throughout this section makes evident that metrics and evaluation systems exert concrete effects on the dynamics of scientific communication. By shaping editorial choices, publication strategies, and the process

of academic recognition, these instruments go beyond serving as mere technical indicators and directly influence how scientific production is organized, valued, and disseminated. Thus, the debate over metrics and evaluation is not limited to operational matters but also concerns the very conditions of knowledge's circulation and legitimation.

Regarding the evaluation of scientific production in the Education field, the Area (CAPES, 2025b) is particularly relevant in the context of this study, especially the section “Perspectives on the Evaluation of Intellectual Production,” as it constitutes a normative document that not only regulates evaluation practices in graduate programs but also reflects a particular understanding of scientific communication in the field and its processes of knowledge legitimation.

In this sense, the evaluation process of graduate programs, especially regarding intellectual production, strongly encourages publication in scientific journals among students, alumni, and faculty members. For the latter, intellectual production is situated at the core of the program’s own evaluation, emphasizing that every professor in graduate Education programs must be a strong researcher. In this scenario, faculty publications are assessed using quantitative parameters, expressed in indicators and in the number of academic products resulting from their research activities (CAPES, 2025b).

The Education area document ratifies the perspective advanced in this study that the scientific journal constitutes the primary vehicle for evaluating intellectual production, explicitly stating that: “Publication in journal articles should be prioritized, without, however, overlooking other vehicles for disseminating the knowledge produced” (CAPES, 2025b, p.25). The document further emphasizes that the evaluation of scientific production in Education must articulate quantitative indicators (such as indexation, citation, and metrics) with qualitative analysis, challenging the uncritical use of metrics and reinforcing the interpretative limits within the field of Education.

With the aim of systematizing and making explicit the main axes guiding the evaluation of intellectual production in the field of Education, in line with the topics already discussed in this study, Table 1 presents a synthesis prepared based on the Area document.

Table 1 – Synthesis of perspectives on the evaluation of intellectual production – Education Area

Axis	Guidelines of the Area Document	Implications for Researchers and Graduate Programs
Scientific Journals / Articles	**Centrality of journals** – the main means of circulation, validation, and recognition of intellectual production in the field of Education	Tendency to prioritize publication in journals as a central strategy for academic recognition
Networks	**Internationalization** – emphasis on the circulation of knowledge	Considerations about publishing topics of local relevance or global visibility Need to publish in other languages (primarily in English)
	Indexers – emphasis on the following: Educ@, Scielo BR, Scopus, Web of Science, Redalyc, ERIC, ERIH Plus, DOAJ, IRESIE, BBE, Latindex, Index Copernicus, Clase	Conditioning of work submissions based on the journal's indexers
Flows	**Focus on good editorial practices** – Journals that do not meet minimum quality requirements will not be considered by the Area: journals with rushed publication practices; without verified peer-review; harassment of authors; republication of materials already published in other journals or books.	Need to identify predatory publishing practices
	Publication time – Categorization of journals based on their age: Established - (at least 10 years); In Process of Consolidation - (at least 5 years); Not Consolidated - (less than 5 years)	Tendency to prioritize publications in journals considered established
Metrics	**Metrics** – Adoption of the h5 index (Google Scholar) as a bibliometric indicator	Tendency to prioritize publications in journals within the field with higher h5 index indices

Source: Created by the authors based on CAPES (2025b).

The guidelines of the Education Are Document (CAPES, 2025b) converge with the perspectives presented in this study, both regarding the centrality of scientific journals in the evaluation of academic production and the understanding that evaluation systems are not neutral. Metrics and classifications, far from constituting merely technical instruments, reflect specific historical and technological paradigms, while also contributing to shape editorial practice, academic trajectories, and scientific visibility regimes. In light of Castells' (1999) considerations on the emergence of the

Network Society, in which information flows play a structuring role in the organization of the economy, labor, and production, it becomes evident that the logic of evaluation of intellectual production is fully embedded in this context. Thus, evaluation does not serve merely as an external or instrumental element but is instead a fundamental part of the paradigms that shape science in the Age of Information, as it directly influences how knowledge is produced, circulated, validated, and legitimized across all fields, including Education.

5 Final considerations

Throughout this study, an effort was made to encourage reflection on how the logic of scientific communication is not dissociated from the paradigms that reshape society as a whole. This interdependence becomes even more evident as the flow of knowledge and innovation are heavily impacted by technological and social dynamics. Castell's (1999) argument that economy, labor, and even cultural identity undergo profound transformation within the Network Society reinforces the idea that scientific communication is also embedded in this process of structural change.

In this way, scientific communication cannot be seen as an isolated process but rather as an integral part of a broad network of interactions in which knowledge is produced, circulated, and validated in a decentralized and interconnected manner. Digital technologies strengthen this scenario, enhancing the visibility of research and enabling knowledge to circulate on a global scale. In the logic of the Network Society, scientific journals operate as nodes and flows of knowledge, interconnecting researchers, institutions, and fields of study in networks of production and circulation of scientific information that favor collaborations and the circulation of theoretical approaches and diverse methodologies.

The trajectory developed throughout the article has made it possible to highlight that scientific journals have consolidated themselves as a central infrastructure of scientific communication, while also operating as instances of legitimization and recognition, and being affected by metric and evaluation systems. Considering them together, these dimensions show how the recent transformations do not concern only the media or technical tools, but the very conditions of organization, circulation, and validation of scientific knowledge.

Regarding the evaluation of intellectual production addressed in CAPES' Education Area Document, it is evident that it is organized around metrics and the journal's reputation. The use of the "perspectives" in the section specifically addressing the evaluation of intellectual production could be understood as a process oriented toward more qualitative possibilities, in which the evaluation of intellectual production would not be presented as a closed set of technical criteria. However, the field has adopted procedures that prioritize bibliometric indices and publication venue, at the expense of a qualitative analysis of the article.

In light of this set of transformations, the issue is not to raise flags or reject certain models of scientific mediation and qualification, but rather to recognize that there is no perfect method capable of addressing with excellence all the nuances and demands of scientific evaluation in all fields of knowledge. Thus, the discussion surrounding metrics and scientific qualifiers must not be restricted to the search for an ideal, infallible model, but rather to the construction of a transparent, balanced system that understands and encompasses the current dynamics of knowledge production across diverse areas of research.

Based on the discussion developed throughout this article, it becomes possible to understand the challenges and opportunities that digital technology directly affects the modes of production, circulation, and validation of scientific information, without implying that technology should be treated as a threat or a solution in itself. Longstanding challenges persist, and new ones emerge, such as digital exclusion and the need for scientific institutions to adapt to the speed and dynamism of the digital era.

Rather than projecting the substitution of media or sources, it becomes essential to recognize the role of this ecosystem in which books, journals, and libraries coexist and are reconfigured, for it is within such an arrangement that the conditions of visibility, legitimation, and evaluation of scientific production are defined. Hence, the construction of a scientific system that is more consistent and socially relevant depends less on isolated technological ruptures and more on how these devices are integrated into the logics of communication, validation, and evaluation of knowledge discussed in this study.

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