

ORIGINAL

Epistemological approach to bibliometric analysis

Aproximación epistemológica al análisis bibliométrico

William Castillo-González^{1,2}  , Javier González-Argote^{1,2}  

¹Universidad Abierta Interamericana. Buenos Aires, Argentina

²A&G Editor. Buenos Aires, Argentina.

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Corresponding author: William Castillo-González 

ABSTRACT

The present article proposes an epistemological approach to bibliometrics, understood not only as a set of quantitative techniques to measure scientific production, but also as a practice loaded with ontological, political and social assumptions that shape the field of knowledge. Through an analytical-interpretative approach, the paradigms that have underpinned its development are critically reviewed, from the positivist and functionalist tradition to constructivist and critical perspectives. The study argues that bibliometrics operates as an evaluation technology that not only reflects science, but also shapes it, establishing normative criteria that condition the production, circulation and legitimization of knowledge. In view of its epistemic limitations and its role in the reproduction of cognitive inequalities, we propose a re-reading from a constructivist-critical paradigm, capable of integrating ethical, contextual and pluralistic dimensions in the evaluation of scientific knowledge. This reflection seeks to contribute to a more just, situated and socially relevant model of science.

Keywords: Epistemological Approach; Epistemology; Bibliometrics; Information Sciences; Scientific Evaluation; Bibliometric Indicators.

RESUMEN

Este artículo propone una aproximación epistemológica a la bibliometría, entendida no solo como un conjunto de técnicas cuantitativas para medir la producción científica, sino como una práctica cargada de supuestos ontológicos, políticos y sociales que configuran el campo del conocimiento. A través de un enfoque analítico-interpretativo, se revisan críticamente los paradigmas que han sustentado su desarrollo, desde la tradición positivista y funcionalista hasta las perspectivas constructivistas y críticas. El estudio argumenta que la bibliometría opera como una tecnología de evaluación que no solo refleja la ciencia, sino que la moldea, estableciendo criterios normativos que condicionan la producción, circulación y legitimación del saber. Frente a sus limitaciones epistémicas y su papel en la reproducción de desigualdades cognitivas, se propone una relectura desde un paradigma constructivista-crítico, capaz de integrar dimensiones éticas, contextuales y pluralistas en la evaluación del conocimiento científico. Esta reflexión busca contribuir a un modelo de ciencia más justo, situado y socialmente relevante.

Palabras clave: Aproximación Epistemológica; Epistemología; Bibliometría; Ciencias de la Información; Evaluación Científica; Indicadores Bibliométricos.

INTRODUCTION

Bibliometrics, as a discipline dedicated to the quantitative analysis of scientific production and its impact, has acquired a central role in the evaluation of knowledge and the dynamics of scientific communication in the 21st century.⁽¹⁾ From its early applications in measuring the growth of scientific literature to its consolidation as a strategic tool for decision-making in academic and scientific policy institutions, bibliometrics has evolved significantly, facing not only technical advances but also fundamental epistemological questions.

Despite its practical success, the conceptual development of bibliometrics has been the subject of debates about its validity, scope, and limitations.⁽²⁾ Like other disciplines, it does not operate in an epistemological vacuum, but instead draws on ontological and methodological assumptions that determine how knowledge is produced and interpreted through its metrics. In this sense, it is essential to reflect on the epistemological foundations that underpin this discipline, from the construction of indicators such as the impact factor and the H index to the growing use of machine learning tools to analyze large volumes of scientific data.

Bibliometric studies have traditionally been perceived as neutral and objective, based on quantitative data that offer seemingly accurate representations of the scientific landscape. However, this perception has been challenged by various critiques that highlight its reliance on reductionist models, its potential to perpetuate structural inequalities, and its lack of sensitivity to the cultural and social contexts of knowledge production.⁽³⁾ Thus, key questions arise: To what extent do bibliometric metrics accurately represent the quality of scientific knowledge? How do these metrics interact with the social, economic, and cultural structures in which they are produced?

In a world increasingly influenced by metrics and data, bibliometrics faces significant challenges, especially in a global environment where power dynamics and inequality condition access to and visibility of scientific production. This raises the need to develop more inclusive and critical approaches that allow for a more balanced and fair analysis.

From this perspective, it cannot be considered simply an auxiliary technique of information science. It is, in itself, a scientific practice with an implicit theoretical framework that needs to be made explicit and discussed. As authors from Popper to Feyerabend have warned, scientific knowledge is not defined solely by its methods, but also by its philosophical assumptions and social purposes.

Therefore, epistemologically questioning bibliometrics is not an abstract exercise. Still, a critical act that seeks to denaturalize its categories, make its assumptions visible, and open the field to more plural, contextualized, and reflective ways of evaluating knowledge.

METHOD

A qualitative analytical-interpretative approach is adopted, based on a critical review of specialized literature. The methodological strategy consisted of a documentary analysis of classical and contemporary epistemological sources, as well as academic texts that address the development and use of bibliometrics. To collect sources, systematic searches were conducted in the Scopus and Google Scholar databases, prioritizing academic articles published in the last five years. The selection criteria included: thematic relevance to bibliometrics and epistemology, recognition, and relevance within the field of information science and social studies of science.

The analytical procedure consisted of a hermeneutic reading of the selected sources to identify the epistemological assumptions that underpin bibliometric practice and its implications for the production, validation, and hierarchization of knowledge. Through this approach, the study sought to construct a theoretical-reflexive basis for understanding bibliometrics not only as a measurement technique, but also as an epistemic practice laden with meanings and effects on the scientific system.

RESULTS AND DISCUSSION

Delimitation of the object of study

Bibliometrics, as a practice oriented toward the quantitative analysis of scientific production, has become a central tool in the evaluation of knowledge.⁽⁴⁾ Beyond its technical dimension, it is necessary to ask what type of knowledge is produced through this practice, what assumptions underpin it, and what epistemic and social consequences its widespread application entails. The interest in bibliometrics is not limited to its formulas and algorithms; what is at stake is the understanding of its status as a form of knowledge that represents, classifies, and regulates science.

A key question that arises in this context is whether bibliometrics can be understood as a science in its own right or whether it should be considered a technique at the service of other disciplines. This question, in turn, refers to the need to explore the epistemological assumptions that define its object of study, its methodological language, and its way of validating what is considered scientific knowledge. The inquiry is not limited to the usefulness of bibliometric indicators. Still, it focuses on the very meaning of these representations: when and why is a highly cited publication associated with high quality? How does a number become scientific evidence? What scientific realities fall outside the framework of visibility offered by bibliometrics?

Bibliometric knowledge is historically part of the empirical-analytical paradigm, characterized by trust in objective measurement, the quantification of phenomena, and verification through observable data. This approach draws on influences from Karl Popper⁽⁵⁾ falsificationism, five who proposed empirical testing as a criterion of scientificity, and also draws on the initial contributions of Eugene Garfield and Derek J. de Solla Price, pioneers in the analysis of citation networks as a manifestation of scientific behavior.⁽⁶⁾ In this framework, science is understood as a cumulative activity, whose products can be traced and evaluated through indicators that reflect their impact or visibility.

However, this view has been widely challenged by approaches that question the neutrality of indicators and propose a more complex reading of science as a social construct.⁽⁷⁾ From a critical epistemological perspective, it is argued that measurement instruments not only reflect scientific reality, but also shape it, selecting what is visible, what is valued, and what is legitimized as valid knowledge. As Thomas Kuhn⁽⁸⁾, science develops within paradigmatic frameworks that define relevant problems, valid methods, and criteria for truth. Along these lines, bibliometric indicators are not innocent tools, but elements that operate within a technocratic paradigm that privileges measurable productivity and international circulation over other values of scientific work.

This criticism is compounded by constructivist perspectives that point out how metrics, when they become instruments of academic management, end up shaping behaviors, guiding lines of research, and establishing hierarchies between disciplines. As Bourdieu⁽⁹⁾ warns, the scientific field is structured by symbolic power relations, and within it, evaluation tools play a key role in the reproduction of academic capital. Bibliometrics, in this sense, not only observes science: it also disciplines, normalizes, and regulates it.

The epistemological delimitation of bibliometrics, therefore, requires recognition that the knowledge it produces does not come solely from empirical observation, but from a network of theories, models, and institutional structures that shape it. Indicators do not emerge in a vacuum: they are the result of prior decisions about what to measure, how to measure it, and for what purpose. Consequently, any critical reading of bibliometrics must consider not only its methods, but also its conditions of possibility, its effects, and its limits. Only then is it possible to fully understand its role within the contemporary scientific production system.

Epistemological positioning

The knowledge sought in bibliometrics transcends the merely technical or descriptive level. It is not just a matter of quantifying publications or measuring impacts, but of understanding the epistemic, social, and political meaning of these measurement practices. Therefore, the approach adopted is oriented towards interpretive and critical knowledge, which allows us to unravel not only how bibliometrics operates, but also what conception of science and truth is reproduced through its indicators. This approach requires questioning both the foundations and the effects of metrics on the production, circulation, and legitimation of scientific knowledge.

From an epistemological point of view, the analysis is situated within a critical and constructivist perspective, in dialogue with interpretive approaches. Unlike the positivist view, which holds that scientific knowledge is objective, universal, and cumulative, critical epistemology recognizes that all forms of knowledge are socially constructed, historically situated, and mediated by power relations. Bibliometrics, viewed from this angle, would not be simply an evaluation technique, but a device that regulates the scientific field, defines productivity standards, and shapes institutional behaviors.⁽¹⁰⁾

This position implies conceiving scientific reality not as a neutral reflection of facts, but as a complex construction determined by the interpretive frameworks imposed by knowledge policies. In this sense, the validity of results cannot be reduced to quantitative criteria or technical replicability. Still, it must include a reflective evaluation of the context, purposes, and consequences of the use of indicators. As authors warn, there is no universal method or neutrality in science: modes of validation depend on dominant paradigms, institutional conventions, and cultural frameworks that shape what is considered legitimate knowledge.⁽¹¹⁾

Therefore, a critical epistemology of bibliometrics does not seek to invalidate its existence, but rather to denaturalize its authority as the sole criterion for evaluation, revealing its limits and opening the debate to broader, more contextualized, and dialogical ways of valuing science. Only from this perspective is it possible to recover epistemic plurality, resist evaluative homogenization, and rethink the very meaning of scientific knowledge today.

What would be the appropriate paradigm for understanding bibliometrics?

Bibliometrics has traditionally been interpreted from the positivist paradigm, which conceives science as an empirical activity based on systematic observation, objective measurement, and the formulation of general laws. This approach has privileged the quantification of scientific production as a way of evaluating its impact, relevance, or visibility. In this framework, bibliometric indicators are considered objective reflections of scientific behavior, and their validity is associated with criteria of replicability, accuracy, and efficiency.⁽¹²⁾

However, the limits of this paradigm are becoming apparent when we observe that indicators not only measure but also prescribe: they determine what is published, where it is published, and under what conditions

knowledge is legitimized. In practice, bibliometrics does not operate solely as an analytical tool, but also as a regulatory device, with real consequences for the modes of production, circulation, and hierarchization of knowledge. In this sense, the positivist paradigm is insufficient to understand the epistemic and social complexity involved in the massive application of metrics in science.

Therefore, a more adequate understanding of bibliometrics requires adopting a constructivist-critical paradigm that recognizes that knowledge is not a neutral representation of the world, but rather a situated construction influenced by interests, contexts, and power structures. From this perspective, bibliometrics is understood not only as a measurement technique, but as a practice that shapes scientific realities, whose categories, such as productivity, impact, or quality, are not neutral empirical evidence, but culturally and institutionally constructed concepts loaded with meaning. The critical constructivist paradigm is a hybrid epistemological position that articulates two fundamental approaches to the theory of knowledge:⁽¹³⁾

- Constructivism, which asserts that knowledge is not a passive copy of reality, but an active construction by the subject in interaction with their cultural, historical, and social context.
- Criticism, which adds an emancipatory dimension, aimed at questioning the power relations, hidden interests, and ideological assumptions that shape both the production and legitimation of knowledge.

Epistemological constructivism, by recognizing the symbolic and cultural mediation of knowledge, allows us to understand that bibliometric indicators do not describe a pre-existing scientific reality, but rather intervene in its constitution, generating performative effects: they transform academic practice, shape research agendas, and condition the symbolic value of disciplines. In turn, the critical approach provides the necessary tools to question the political and economic ends underlying the use of metrics, especially in contexts where quantitative evaluation becomes the exclusive criterion of academic excellence.⁽¹⁴⁾

For all these reasons, there is no single, closed paradigm that is best suited to addressing bibliometrics. A pluralistic and integrative epistemology is required, one that recognizes its technical component, but also its normative and symbolic dimension. This view must combine the quantitative with the qualitative, the empirical with the interpretive, and the technical with the ethical-political. Only from a critical and constructivist perspective is it possible to overcome the overestimation of indicators and promote forms of evaluation that respect epistemic diversity and the different modes of knowledge production in the sciences, whether exact, social, or humanistic.

Theoretical perspectives

This phenomenon, understood as the systematic use of indicators to measure the production and impact of scientific knowledge, has been addressed from multiple theoretical frameworks that explain its emergence, consolidation, and functioning. Far from being a purely technical practice, it is part of a complex network of knowledge, institutional structures, scientific policies, and epistemic logics that make it a multidimensional object of analysis.⁽¹⁵⁾

One of the foundational theories for understanding bibliometrics comes from scientometrics, a field that emerged in the 20th century in response to the need to observe the growth of science empirically. Derek de Solla Price and Eugene Garfield proposed that science could be analyzed as a self-regulating system with quantifiable patterns, visible in publications, citations, and collaboration networks. From this perspective, bibliometrics is built on concepts such as impact, visibility, and productivity, understood as objective indicators of scientific behavior. This view is anchored in a positivist and functionalist theoretical framework, where quantitative data are treated as faithful expressions of scientific reality.⁽⁶⁾

In contrast, other, more critical and reflective theories have questioned the supposed neutrality of these indicators. Social studies of science and technology argue that bibliometric indicators do not simply reflect science, but constitute it. It has been shown how scientific practices are deeply intertwined with social contexts, power structures, and processes of symbolic negotiation. Along these lines, bibliometrics is seen as a technology of governance that not only measures but also conditions, guides, and normalizes scientific behavior, shaping research agendas and reinforcing institutional hierarchies.⁽¹⁶⁾

In turn, bibliometrics can be understood as an instrument for the accumulation and distribution of symbolic capital. In the academic field, indicators operate as mechanisms of distinction, establishing which actors, disciplines, or journals enjoy greater legitimacy. This perspective emphasizes the structuring and regulatory nature of evaluation devices, highlighting how they participate in the reproduction of relations of domination within the academic world.⁽⁹⁾

From an epistemological constructivist perspective, on the other hand, it is argued that the central concepts of bibliometrics are not universal categories, but cultural and historical constructs. Consequently, there is no single legitimate way of evaluating knowledge, but rather a plurality of possible criteria, whose validity depends on the field of expertise, the institutional context, and the purpose of the evaluation. This view comes into direct tension with the “standardizing” logic promoted by international metrics, which are often

insensitive to local or disciplinary specificities.⁽¹⁷⁾

As for the debates, there are notable tensions between technocratic currents, which promote the intensive use of metrics as objective tools for management and accountability, and critical currents, which warn against reducing knowledge to numerical indicators. The latter denounce the risk of science becoming a race to accumulate citations and publications, emptied of epistemic, ethical, or social meaning. There are also disputes within the bibliometric field about the relevance of specific indicators, such as the impact factor, the h-index, or ranking systems, which have led to the development of alternative approaches such as altmetrics or qualitative assessment models.^(18,19,20)

In short, bibliometrics cannot be understood from a single theory or discipline. Its analysis requires an integrative approach that brings together contributions from scientometrics, the sociology of knowledge, critical epistemology, and science and technology studies. Only from this theoretical plurality is it possible to rigorously and contextually address a phenomenon that is so influential in the contemporary structure of knowledge.

Validation and evaluation of bibliometric knowledge

The validation of knowledge within the field of bibliometrics has historically been anchored in an empirical-quantitative logic, typical of the positivist paradigm. In this approach, knowledge is considered valid to the extent that it can be measured, replicated, and expressed through objective data. Therefore, the most commonly used methods to legitimize claims in bibliometrics have been statistical analysis, observation of quantifiable patterns (such as citations, co-authorship, or impact), and comparison of indicators through time series or indexed databases. The intensive use of computational tools has reinforced this perspective, allowing for the automation of processes and the generation of metrics on a large scale.

In this context, the legitimization of knowledge has been based on the presumption of technical neutrality and numerical precision. Indicators such as the h-index, impact factor, or citation counts are often presented as objective expressions of the scientific value of an article, author, journal, or institution. This form of validation responds to an instrumental notion of knowledge, where the emphasis is on evaluative efficiency rather than on critical understanding of the content or context of the knowledge produced. Thus, the value of knowledge tends to be equated with its visibility, productivity, and frequency of citation.

However, this validation model has been strongly questioned.⁽²¹⁾ From an interpretive and constructivist perspective, it has been argued that indicators are not simple reflections of scientific reality, but tools that construct specific meanings, norms, and hierarchies within the academic field. Knowledge is not legitimized solely by its quantitative measurement, but by the way it is recognized, appropriated, and contextualized within a specific scientific community. In this sense, metrics should be understood as situated representations that depend on prior decisions about what to measure, for what purposes, and under what conditions.^(17,22)

Furthermore, from critical perspectives, it has been pointed out that the validation methods used by bibliometrics are deeply influenced by institutional, commercial, and political interests, especially in the context of rankings, accreditations, and performance-based funding. In many cases, external and numerical validation is privileged over the internal criteria of epistemic communities, such as methodological rigor, theoretical originality, or the social relevance of knowledge. This creates a displacement effect, where the legitimacy of science is subordinated to market logic, efficiency, and global competition.^(23,24,25)

In response to this situation, it has been proposed to broaden validation methods by incorporating qualitative techniques, content analysis, contextualized peer review, and studies of the reception and use of knowledge. Instead of relying exclusively on bibliometric indicators, it is suggested that mixed approaches be integrated that combine empirical measurement with critical interpretation, recognizing that the validity of knowledge is also an ethical, political, and cultural issue.⁽³⁾ The current trend toward comprehensive and contextualized evaluation requires overcoming the hegemony of numbers as the only form of truth, opening space for other ways of knowing, justifying, and legitimizing scientific knowledge.

On the other hand, the evaluation of knowledge as a field is traversed by at least three significant epistemological tensions:

- The first is the tension between universal and contextual criteria. While bibliometric metrics are presented as valid in any field or region, many researchers argue that the quality and value of knowledge are always contextual, dependent on the scientific community, the area of study, and the social function of knowledge.⁽²⁶⁾
- The second tension is between quantitative and qualitative assessment. Bibliometrics is based on numbers, but many disciplines, especially in the social sciences and humanities, cannot be reduced to figures without losing content and meaning. In such cases, evaluation requires narrative analysis, interpretation of social impact, and assessment of conceptual or critical contribution, which challenges the dominance of numerical indicators.⁽²⁷⁾
- The third tension concerns the ultimate meaning of evaluation. While some models privilege evaluation as a mechanism for control, efficiency, and competition, others understand it as a pedagogical

and democratizing practice aimed at strengthening academic communities, improving research, and generating knowledge with public value.^(12,28)

Recognizing bibliometrics as part of the field of knowledge assessment involves shifting the focus from a technical perspective to a political, cultural, and epistemic one. It means questioning who defines what counts as valid knowledge, what interests are at stake in the measurement of science, and what the consequences are of using specific assessment tools over others. From this perspective, bibliometrics is not neutral: it is a performative act that shapes what is researched, how it is researched, and why it is researched. Therefore, it must be analyzed not as a closed and autonomous field, but as a subfield within a broader ecology of knowledge assessment practices. An ecology in which different logics coexist and compete: that of quantitative performance, that of peer recognition, that of social innovation, that of technological utility, and that of cultural transformation. In this ecology, it can play a helpful role, provided that it is relativized, contextualized, and subordinated to broader ethical, epistemic, and social principles.

Uses and limitations of bibliometric knowledge

The knowledge produced in the field of bibliometrics does not remain at the theoretical level, but has a direct and structuring application in the contemporary scientific system. Its transfer occurs mainly through evaluation policies, research management, academic planning, institutional ranking design, and resource distribution. In this sense, bibliometrics not only interprets science: it also actively intervenes in its organization, orientation, and hierarchization.⁽²⁵⁾

One of the most visible uses of bibliometrics is its role in academic evaluation processes. Universities, state science and technology agencies, accreditation bodies, and scientific publications use bibliometric indicators to make decisions about promotion, funding, hiring, and recognition. This logic turns indicators into instruments of institutional power, capable of rewarding or excluding research careers based on their visibility and quantification. Productivity.⁽²⁹⁾

This knowledge also has practical applications in the design of science policies, by offering diagnoses of the state of production in different disciplines, regions, or institutions. In this way, bibliometrics allows for the establishment of investment priorities, the detection of emerging areas, the identification of collaboration networks, and the orientation of strategies for the internationalization of knowledge. In contexts of increasing global competitiveness, this analytical capacity has become highly valuable for governments and academic institutions.⁽²⁸⁾

However, the impact of bibliometrics is not merely technical, but also social and cultural. The way science is measured affects researchers' practices, shapes their decisions about what, where, and how to publish, and redefines the criteria for what is considered "good" science. In this sense, bibliometrics contributes to the consolidation of specific ways of doing science, especially those aligned with the most visible, internationalized, and measurable formats, to the detriment of other, more contextualized, local, or critical forms. This knowledge, therefore, not only describes the academic world but also has real effects on its nature. Functions.⁽²¹⁾

One of the main limitations of bibliometric knowledge is its dependence on international indexing systems, such as Scopus or Web of Science, which favor specific languages, regions, disciplines, and publication formats.⁽³⁰⁾ This dependence creates a structural bias that renders invisible or undervalues a significant portion of scientific knowledge produced in peripheral contexts, in non-hegemonic languages, or in fields that do not conform to standardized productivity parameters. Thus, bibliometrics contributes to reproducing epistemic asymmetries, reinforcing the dominance of specific centers of academic power to the detriment of other legitimate forms of knowledge.⁽¹⁷⁾

There are also ideological constraints that shape the way science is valued. The emphasis on metrics such as the h-index or impact factor expresses an instrumental conception of knowledge, where what matters is not the content, originality, or social relevance of research, but its quantitative performance. This logic is aligned with the principles of academic liberalism, where science is conceived as a productive system governed by indicators, rankings, and competition among researchers. Bibliometrics, in this context, becomes a management technology rather than an instrument for critical understanding of science.

Added to these constraints are the epistemological biases that operate in the sources of knowledge used. Most databases and measurement systems are designed from a particular view of science that excludes other modes of knowledge production. Even in the social sciences and humanities, where creative processes are more interpretive and narrative, quantitative metrics have been forced upon us that do not always adequately reflect the quality or impact of contributions. By imposing itself as an evaluative standard in fields where its logic is foreign, bibliometrics introduces an epistemological distortion that alters forms of research and publication, generating tensions between academic content, visibility, and citation criteria.

In this sense, recognizing the limitations of bibliometric knowledge also implies adopting a critical attitude toward the conditions that shape it.⁽³⁰⁾ The production of knowledge is not a purely technical act, but a

situated practice, traversed by relationships, institutional frameworks, cultural values, and strategic decisions. Therefore, any epistemological reflection on bibliometrics must include an analysis of its structural constraints, to denaturalize its assumptions and open the way to fairer, more plural, and contextualized forms of evaluating scientific knowledge.

Towards a reflective, plural, and situated bibliometrics: An alternative epistemological proposal

Faced with the hegemonic model of bibliometrics based on positivist, productivist, and quantitative logics, it is necessary to move towards a reformulated approach that recognizes the epistemic, cultural, and political limitations of current evaluation systems. This alternative proposal advocates for a reflexive, plural, and situated bibliometrics that articulates the contributions of metrics with a critical, contextual, and epistemologically inclusive perspective.

1. Reflective bibliometrics: overcoming the illusion of neutrality

Bibliometrics cannot continue to operate under the assumption that its indicators are objective representations of scientific quality. It is essential to recognize that all measurement involves a selection of criteria, a situated interpretation, and a political or institutional purpose. Consequently, we propose a bibliometrics that not only measures but also reflects on its assumptions, scope, and consequences. This includes making its algorithms transparent, questioning its arbitrary thresholds, and subjecting its categories to constant critical review.

2. Plural bibliometrics: articulating the quantitative with the qualitative

The reformist approach involves abandoning numerical reductionism and recognizing that metrics cannot fully capture the quality of knowledge. Bibliometrics must be integrated with other forms of evaluation such as contextualized peer review, social or cultural impact assessment, and qualitative content analysis. This plural perspective does not discard metrics, but relativizes, contextualizes, and complements them within a richer and more multidimensional system of knowledge assessment.

3. Situated bibliometrics: recognizing epistemic diversity

Science is not produced homogeneously or under equivalent conditions. Therefore, evaluation must recognize the diversity of languages, methodologies, audiences, and academic cultures. This requires adopting a situated approach that considers the geographical, linguistic, and disciplinary context of scientific production. For example, evaluating research on rural education in Spanish cannot be guided by the same parameters as a publication on biotechnology in English. Reformed bibliometrics must operate with criteria that are sensitive to the particularities of the environment.

4. Evaluation for transformative purposes

Beyond classification and ranking, the evaluation system should aim to promote socially relevant, ethically responsible, and culturally significant science. In this vein, bibliometrics should include dimensions such as contribution to local development, the generation of intercultural dialogue, educational impact, and commitment to social and environmental challenges. This is bibliometrics at the service of a more democratic, open, and transformative scientific model.

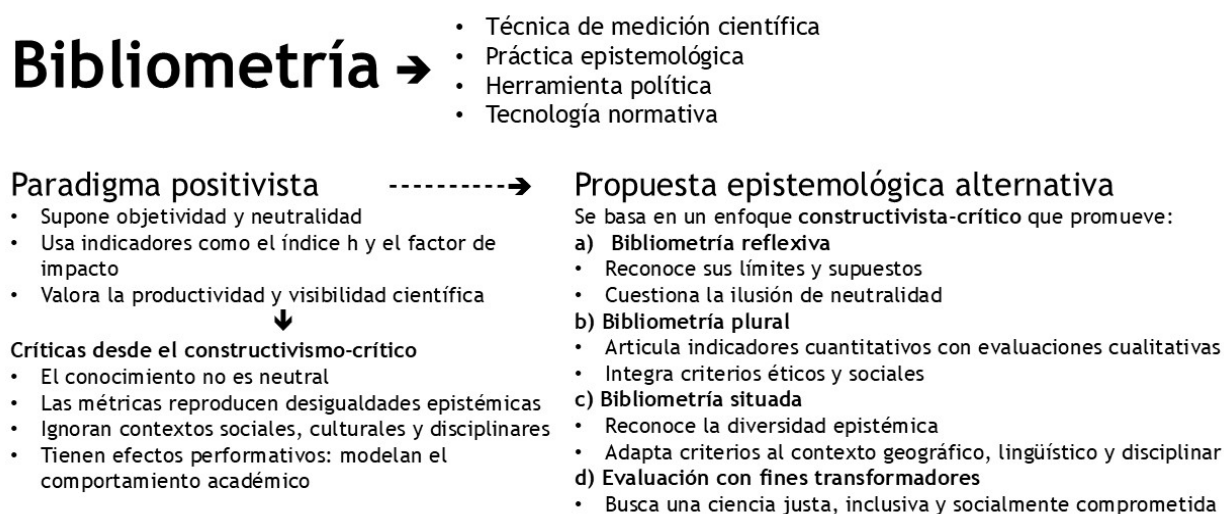


Figure 1. Conceptual map of the alternative epistemological proposal

CONCLUSIONS

The epistemological approach to bibliometrics allows us to dismantle the appearance of neutrality that has traditionally accompanied this field of analysis. Far from being an objective and purely instrumental technique, bibliometrics emerges as a theoretical, social, and political construct deeply rooted in particular epistemic paradigms. Its historical evolution, initially anchored in postulates of empiricism and functionalism, reveals a model of knowledge where the quantification of scientific impact and visibility is taken as a direct expression of the value of knowledge. However, this assumption has been questioned from multiple critical perspectives that highlight the performative, normative, and exclusionary nature of bibliometric indicators.

The analysis carried out shows that bibliometric knowledge is influenced by institutional structures, ideological interests, and interpretive frameworks that define what is measured, how it is measured, and why it is measured. In this sense, the relationship between the subject and object of knowledge is revealed as intrinsically mediated, breaking with the myth of impartial observation. In addition, cultural, linguistic, and geographical limitations are evident, reproducing epistemic hierarchies and reinforcing dynamics of exclusion in the circuits of scientific legitimation.

Likewise, bibliometrics, as part of the broader field of knowledge assessment, plays a structuring role in the organization of contemporary science. Its applications are not merely diagnostic, but also prescriptive: they condition academic behavior, guide research agendas, and shape the rules of institutional recognition. This gives it a political dimension that must be questioned from the perspectives of ethics, epistemology, and cognitive justice.

Faced with these challenges, we propose rethinking bibliometrics from a constructivist-critical approach that recognizes epistemic plurality, the contextuality of knowledge, and the need to integrate qualitative, reflective, and participatory methods into evaluation processes. A reformulated bibliometrics must abandon the claim to represent science in the abstract and become a situated, transparent tool at the service of a more diverse, socially relevant, and epistemologically just science.

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AUTHOR CONTRIBUTION

Conceptualization: William Castillo-González, Javier González-Argote.

Data curation: William Castillo-González, Javier González-Argote.

Formal analysis: William Castillo-González, Javier González-Argote.

Research: William Castillo-González, Javier González-Argote.

Methodology: William Castillo-González, Javier González-Argote.

Project management: William Castillo-González, Javier González-Argote.

Resources: William Castillo-González, Javier González-Argote.

Software: William Castillo-González, Javier González-Argote.

Supervision: William Castillo-González, Javier González-Argote.

Validation: William Castillo-González, Javier González-Argote.

Visualization: William Castillo-González, Javier González-Argote.

Original draft: William Castillo-González, Javier González-Argote.

Writing - revision and editing: William Castillo-González, Javier González-Argote.