
Scope and Limits of the State of the Art: Methodological and Epistemic Reflections

¹Edward Fabian Mendoza Ustariz, ²Gloria Marina Rosado Galindo, ³Oswaldo Rueda Carreño ⁴Diva Jiménez Corzo

¹Universidad Popular del Cesar. Valledupar, Colombia.

²Universidad Popular del Cesar. Valledupar, Colombia.

³Universidad Popular del Cesar. Valledupar, Colombia.

⁴Universidad Popular del Cesar. Valledupar, Colombia.

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Abstract

Introduction: The state of the art is configured as an essential methodological tool for scientific research, as it enables the identification, organization, and critical interpretation of accumulated knowledge related to a specific problem, discipline, or area. It goes beyond the mere compilation of sources, requiring the analysis of trends, gaps, and approaches. Its value lies in guiding the delimitation of the research problem and strengthening the construction of theoretical and methodological frameworks

Methods: This work was developed under the interpretive paradigm, with a qualitative approach and hermeneutical method. The reflection was based on a documentary review of specialized literature, prioritizing recent and relevant sources. Critical analysis made it possible to integrate theoretical and methodological contributions, recognizing the scope and limits of the state of the art in research.

Resultados y Conclusiones: The analysis revealed that the state of the art simultaneously constitutes an exercise in documentary systematization and critical interpretation. Its scope is expressed in the ability to integrate knowledge, identify gaps, guide objectives, and generate new research questions. However, it faces limitations related to unequal access to sources, the temporality of documents, and interpretive subjectivity. It is concluded that its value lies in offering an integrative vision of the field, while acknowledging historical, social, and methodological constraints.

Keywords: State of the art; research; methodology; interpretation; knowledge

1. Introduction

The concept of "state of the art" comes from the English expression *state of the art*, initially used in engineering to indicate the most advanced level of technological development reached at a specific moment (Harper-Collins, 2003). Transferred to the field of scientific research, this term is understood as the systematic and critical review of existing academic literature on a research problem, with the purpose of providing an integrative overview of accumulated knowledge and its trends (Molina, 2005; Gómez et al., 2015).

The state of the art, therefore, is not limited to a list of annotated references but constitutes a form of documentary research aimed at organizing and interpreting sources, identifying theoretical approaches, categories, methodologies, and knowledge gaps (Guevara, 2016; Martínez et al.,

2024). Its construction supports the delimitation of the research problem, the coherence of the conceptual framework, and the justification of the study in both academic and social terms.

Nevertheless, this resource also presents limits related to unequal access to databases, the selection of search criteria, the partiality of theoretical approaches, and the changing nature of scientific production (Londoño, Maldonado & Calderón, 2014). Such restrictions require situating the state of the art as a critical exercise rather than a definitive synthesis.

This article aims to reflect on the scope and limits of the state of the art, drawing on contributions from specialized literature and presenting a methodological discussion from the interpretive paradigm (Martínez, 2010), the qualitative approach (Martínez et al., 2022), and the hermeneutic method, in order to highlight its

value as an epistemic and formative practice in scientific research

2. Methodology

This work is based on a documentary and reflective review supported by three methodological axes. First, the interpretive paradigm, which conceives scientific knowledge as a situated and subjective construction linked to the meanings that researchers attribute to social phenomena (Martínez, 2010). Second, the qualitative approach, which recognizes the importance of narratives, experiences, and contexts in academic production, and which allows the interpretation of theoretical and methodological contributions on the state of the art beyond a purely quantitative or descriptive perspective (Martínez, Salcedo & Romero, 2022). Finally, the hermeneutic method, understood as the means to understand, analyze, and critically interpret the texts reviewed, integrating different perspectives into a broader and more coherent vision of the object of study (Gadamer, 1977).

The methodological process was organized into three phases:

1. **Source selection:** inclusion of relevant books, articles, and methodological guides (Hernández et al., 2018; Martínez et al., 2024; Gómez et al., 2015; Guevara, 2016).
2. **Critical analysis:** identification of objectives, foundations, structures, and debates surrounding the state of the art.
3. **Interpretive synthesis:** integration of findings regarding its scope and limits, highlighting methodological and epistemic tensions.

The hermeneutic approach made it possible to establish a dialogue between texts, recognizing convergences and divergences in how the state of the art is conceived. Rather than aiming at an exhaustive compilation, the intention was to reflect on its value and limitations, emphasizing its dynamic and situated character within the research process.

3. Results

The state of the art, understood as the systematization, critical analysis, and interpretation of existing knowledge on a topic, constitutes a key methodological tool in scientific research. Beyond compiling sources, it seeks to identify trends, gaps, and prevailing approaches that guide the delimitation of the

problem and the formulation of new questions. From an interpretive and hermeneutic perspective, it stands as a dynamic exercise that offers an integrative vision, albeit conditioned by limits of access, temporality, and subjectivity.

3.1. What is a state of the art?

The term *state of the art* originates from the English expression, initially used in engineering and technology to describe the most advanced level of development achieved at a specific moment (HarperCollins, 2003). In academia, this concept has been recontextualized to refer to the systematization, critical analysis, and interpretation of existing literature on a specific research topic.

Authors such as Molina-Montoya (2005) emphasize that the state of the art is not a simple bibliographic inventory, but rather a research practice that involves identifying patterns, approaches, and gaps in academic production. According to Gómez et al. (2015), it constitutes a methodology aimed at reconstructing the horizon of accumulated knowledge, allowing for the delimitation of the research problem and the strengthening of the study's justification.

In this sense, the state of the art differs from the theoretical framework, as it does not seek to develop an exhaustive conceptual body, but rather to identify trends and previous results that frame the problem under study. While the theoretical framework is normative and explanatory, the state of the art is analytical and critical, making it an indispensable input for the construction of the former (Martínez et al., 2024).

3.2. Objectives of a state of the art

The elaboration of a state of the art fulfills several fundamental purposes within the research process:

1. **Contextualize the research problem:** situates the object of study in relation to previous advances and existing scientific production (Guevara, 2016).
2. **Identify theoretical and methodological trends:** helps recognize dominant currents, widely used categories, and recurrent methodologies in the field.
3. **Detect gaps and research opportunities:** through comparative text analysis, it highlights underexplored areas, contradictions, or open questions (Gómez et al., 2015).
4. **Justify the relevance of the study:** by showing that the problem has not been sufficiently

addressed, the state of the art legitimizes the proposed research.

5. Generate new questions and approaches: stimulates the construction of hypotheses, objectives, or innovative conceptual frameworks (Martínez et al., 2024).

Thus, the state of the art is not limited to a documentary synthesis, but acquires a strategic role in defining the direction of research.

3.3. Foundations for constructing states of the art

The foundations for preparing a state of the art rest on principles of systematization, coherence, and criticality. According to Rivas (2023), a state of the art requires:

- A clearly defined topic.
- A delimitation of the problem based on a research question or general objective.
- The review of at least 10 to 20 relevant and recent academic sources, ideally published within the last ten years.
- The identification of theories, methodologies, and results of each text reviewed.
- The selection of the most pertinent sources, avoiding redundant or low-quality materials.

Martínez et al. (2024) stress that the construction of a state of the art must be guided by hermeneutic criteria, which means that the researcher interprets texts in dialogue with the research problem, rather than limiting themselves to describing them. This interpretive character ensures that the state of the art provides a critical contribution, beyond a compilation of summaries.

3.4. Key notes for elaboration

Some methodological guidelines are essential for a rigorous practice of the state of the art:

- Exhaustive but selective review: it is not about covering all existing texts, but about choosing the most relevant and representative in the field.
- Critical analysis: the researcher must contrast findings, identify contradictions, and highlight gaps, rather than transcribing fragments or preparing simple summaries.
- Current sources: the review should prioritize recent texts, without neglecting classical works that constitute conceptual foundations of the field (Molina, 2005).

- **Coherent organization:** ideas should be grouped into thematic categories or axes of analysis to facilitate the understanding of knowledge evolution.
- **Clarity in writing:** the state of the art should be presented as a narrative and argumentative document, avoiding mechanical lists of references (Baeza, 2008).

In practical terms, Martínez et al. (2024) suggest that the elaboration of a state of the art involves constructing a map of authors, theories, and methodologies, which is then articulated into a coherent and critical narrative.

3.5. Structure of the state of the art

The reviewed literature agrees that a state of the art should contain at least the following sections (Martínez et al., 2024; Gómez et al., 2015):

1. Title: directly linked to the research problem.
2. Introduction: presents the topic, the relevance of the state of the art, and the methodology used for its construction.
3. Core or development: constitutes the central axis of the document, where the literature review is organized, main arguments are presented, and critical analysis is conducted.
4. Conclusions: summarize the most significant findings, identify trends and gaps, and suggest directions for future research.
5. Bibliography: compiles the sources consulted, organized under international citation standards.

This basic structure can be adapted to different types of research but must always ensure an argumentative thread that integrates the reviewed information.

3.6. Scope of the state of the art

The main scopes of a state of the art can be summarized as follows:

- Integrative vision: by gathering and analyzing multiple sources, it provides a broad overview of available knowledge (Guevara, 2016).
- Problem delimitation: guides the definition of the object of study and the formulation of coherent objectives.
- Theoretical and methodological strengthening: serves as input for building the theoretical framework and selecting methodological strategies (Palacio & Múnica, 2007).

- Identification of gaps and opportunities: makes it possible to recognize unexplored areas, contributing to innovation in research (Baeza, 2008; Gómez et al., 2015).
- Formative contribution: strengthens research skills by fostering analytical, synthetic, and argumentative capacities (Bojacá, 2004; Martínez et al., 2024).

A practical example is research in higher education: a state of the art on active teaching methodologies not only synthesizes previous experiences but also reveals trends toward pedagogical innovation and highlights gaps regarding its impact in rural contexts.

3.7. Limits of the state of the art

Despite its contributions, the state of the art presents limits that must be recognized:

1. Access to sources: not all researchers have equal access to databases, conditioning the scope of the review (Hernández et al., 2018).
2. Temporality: states of the art are snapshots of a specific moment; therefore, they can quickly become outdated in areas of fast-paced production, such as artificial intelligence or biomedicine (Martínez et al., 2024).
3. Selection bias: researchers' decisions on what sources to include or exclude may condition the interpretation of findings.
4. Interpretive diversity: different researchers may arrive at different conclusions from the same sources, reflecting the hermeneutic nature of this exercise.
5. Writing limitations: in collective projects, heterogeneity in writing styles can hinder argumentative coherence (Guevara, 2016).

An illustrative example can be found in social sciences reviews: two states of the art on citizen participation may reach opposite conclusions if one privileges normative approaches and another adopts critical perspectives, showing both the richness and interpretive limitations of this exercise.

The state of the art is a complex methodological strategy that combines documentary review, critical analysis, and hermeneutic interpretation. Its most significant scopes lie in its ability to integrate, contextualize, and project accumulated knowledge. Its limits, in turn, relate to access restrictions, temporality, subjectivity, and the complexity of writing. Recognizing both aspects allows the state of the art to be conceived not as a closed synthesis but as a dynamic and constantly updated exercise.

4. Discussion

Reflecting on the scope and limits of the state of the art reveals that this methodological tool is not merely a technical exercise but also an epistemic and formative process that positions the researcher in relation to existing knowledge production. In this sense, the state of the art is framed within the interpretive paradigm, as it acknowledges the researcher's subjectivity and the hermeneutic mediation involved in reading, selecting, and interpreting sources (Martínez, 2010). This perspective challenges the positivist view of documentary review as a neutral process, emphasizing that every synthesis entails interpretive decisions that shape results.

One of the central debates surrounding the state of the art lies in its systematization versus its interpretive nature. On one hand, methodological rigor is required in the selection of sources, the definition of criteria, and the organization of information (Hernández et al., 2018). On the other, the researcher is not a mere compiler but an interpreter who re-signifies texts according to the research problem (Gómez et al., 2015). This tension should not be framed as a false dichotomy, but as a balance: systematization ensures transparency and replicability, while interpretation provides meaning and depth.

In terms of its scope, the state of the art plays a decisive role in the development of research competencies. By engaging with multiple texts, the researcher develops critical reading, comparison, synthesis, and argumentation skills. These competencies not only strengthen the construction of the theoretical framework but also enhance the ability to pose innovative and original questions (Martínez et al., 2024). Thus, more than a preliminary step, the state of the art becomes a strategic phase that guides the course of research.

However, the limits of this exercise are equally significant and demand critical attention. One of the main challenges is unequal access to information. Current research depends heavily on specialized databases that often require costly subscriptions, placing researchers from less-resourced institutions at a disadvantage (Guevara, 2016). This limitation is not minor, as it restricts the diversity of voices and perspectives included in states of the art, sometimes reinforcing hegemonic views of certain fields.

Another relevant limitation is temporality. As a snapshot of available knowledge at a given moment, the state of the art risks becoming quickly outdated in fields with accelerated production, such as biotechnology, artificial intelligence, or emerging

legal sciences. This limitation requires understanding the state of the art as a process of continuous revision rather than a definitive product (Martínez et al., 2024).

Selection biases also represent an inherent limit to the interpretive nature of the state of the art. Each researcher establishes inclusion and exclusion criteria that, although justified, are also influenced by theoretical, ideological, or pragmatic perspectives. This explains why two states of the art on the same topic can arrive at different conclusions. Such diversity does not necessarily weaken the practice but rather reveals its hermeneutic richness, provided the researcher explicitly states their criteria and analytical frameworks (Molina, 2005; Bojacá, 2004; Palacio & Múnera, 2007; Baeza, 2008).

An ethical aspect that emerges in this discussion is the responsibility in writing the state of the art. It is not about compiling quotations or copying fragments but about constructing an argumentative text that connects previous findings with the researcher's own reflections. In this regard, the contribution of Martínez et al. (2022) on observation as a research technique is illustrative: just as observation requires a critical and reflective observer, the state of the art demands an author who positions themselves, interprets, and engages in dialogue with texts.

From a formative perspective, states of the art are highly valuable in university teaching, as they help students understand that research does not begin in a vacuum but in a field already shaped by theories, methodologies, and accumulated findings (Gómez et al., 2015). However, this pedagogical value also faces limitations: many students tend to confuse the state of the art with a simple bibliographic review, which weakens its reflective dimension. Hence the importance of clear methodological guidelines, such as those proposed by Martínez et al. (2024), which provide a didactic and practical structure to guide its construction.

Finally, on a broader level, the scope and limits of the state of the art can be understood as reflecting the tensions between accumulated knowledge and new meanings. While some view it as a tool for systematizing existing work, others value it as a way of exploring new perspectives (Guevara, 2016). This duality shows that the state of the art should not be conceived as a closure but as an opening toward new research possibilities.

In summary, the discussion reveals that the state of the art is a methodological practice situated between systematization and interpretation, between the accumulated and the emerging. Its scope lies in its

ability to provide integrative and reflective panoramas; its limits, in turn, highlight the constraints of the research context and call for assuming with responsibility the interpretive nature of every academic synthesis.

5. Conclusions

The state of the art is configured as a methodological and epistemic tool essential in the process of scientific research. Its elaboration not only makes it possible to systematize and organize academic production on a given topic but also to critically analyze the approaches, trends, and gaps that shape a field of study. In this sense, it constitutes a strategic resource for problem delimitation, the formulation of objectives, and the justification of the research project.

The scope of the state of the art is broad: it offers an integrative vision of knowledge, strengthens the construction of theoretical frameworks, contributes to the definition of categories and methodologies, and stimulates the generation of new research questions. Likewise, in the formative dimension, it becomes a valuable practice for developing critical and reflective competencies among emerging researchers.

Nevertheless, this exercise presents limits that must be acknowledged. Among them are unequal access to academic sources, temporality that conditions its validity, biases derived from text selection, and the diversity of possible interpretations. Such limitations should not be understood as insurmountable weaknesses but rather as reminders of the need to conceive the state of the art as a situated, dynamic practice subject to constant updating.

In conclusion, the scope and limits of the state of the art show that this resource is not a finished product but a process in permanent construction. Its value lies in the capacity to articulate accumulated knowledge with new perspectives, offering the researcher not only an overview of what is already known but also a horizon of possibilities for advancing scientific production.

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