



Systematic Literature Review on Social Epistemology of Science: Knowledge Production in Scientific Communities

Yanti Kristina Sinaga^{1*}, M. Manugeren², Efendi Barus³

^{1,2,3} Kajian Bahasa Inggris, Fakultas Sastra, Universitas Islam Sumatera Utara

Corresponding email: yanti.sinaga@uhnnp.ac.id

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Abstract

This paper presents a systematic literature review of research published between 2015 and 2025 on the social epistemology of science, focusing on how scientific knowledge is produced within communities. Moving beyond traditional individualistic epistemologies, the review highlights four dominant themes: epistemic trust and authority, collaborative and collective knowledge production, institutional norms shaping epistemic practices, and epistemic injustice affecting marginalized groups. Findings reveal that scientific knowledge depends heavily on social interactions, trust networks, and institutional frameworks that guide what counts as credible and valuable knowledge. The review also uncovers the significant influence of funding structures, publication pressures, and performance metrics in shaping scientific inquiry, often privileging dominant voices and methodologies. Epistemic injustice emerges as a critical issue, emphasizing the need for more inclusive and diverse epistemic practices within science. By synthesizing philosophical and empirical work, this study underscores the importance of understanding science as a socially situated and institutionally embedded practice. The paper concludes by advocating for greater integration of diverse perspectives and institutional reforms aimed at promoting epistemic equity, accountability, and transparency. This social epistemological approach offers a promising framework for rethinking scientific knowledge production in ways that are more democratic, ethical, and responsive to contemporary challenges.

Keywords: Social Epistemology, Scientific Knowledge, Epistemic Trust, Institutional Norms, Epistemic Injustice

Introduction

In recent decades, the philosophy of science has undergone a shift from focusing solely on individual cognition and logic to examining the social dimensions of knowledge production. This shift, often associated with the emergence of social epistemology, explores how social interactions, institutions, norms, and power structures influence what is considered knowledge and how it is produced (Goldman, 1999; Longino, 2002). Nowhere is this shift more evident and consequential than in the scientific community, where research practices are increasingly recognized as collaborative, institutionally embedded, and shaped by external factors such as funding, policy, and public trust.

Social epistemology of science investigates the ways in which knowledge claims within scientific communities are influenced by social processes rather than merely by empirical data or logical reasoning. The traditional view of science as an objective, value-free enterprise has been challenged by scholars who argue that social factors are integral—not incidental—to scientific reasoning (Harding, 1991; Kitcher, 2001). As a result, questions of trust, credibility, consensus, and authority have become central to understanding how scientific knowledge is constructed and validated.

This epistemological turn has prompted increasing interest in studying science as a social institution that operates within broader networks of power and communication. For instance, Helen Longino's (2002) work on "contextual empiricism" argues that diversity of perspectives and open criticism are essential conditions for scientific objectivity. Similarly, Philip Kitcher (2001) proposes a model of "well-ordered science" that links scientific progress to democratic deliberation and public interest. These perspectives highlight how the norms and structures within scientific communities significantly affect the kind of knowledge that emerges from them.

Despite a growing body of theoretical work, there remains a lack of systematic synthesis regarding how social epistemological frameworks have been applied to the study of knowledge production within scientific communities. Much of the literature is fragmented across philosophy, sociology of science, science and technology studies (STS), and communication theory. As such, scholars and practitioners may struggle to gain a comprehensive understanding of how various social factors—such as collaboration, funding, peer review, or institutional bias—shape scientific knowledge.

This paper addresses that gap by conducting a Systematic Literature Review (SLR) of peer-reviewed studies that apply social epistemology to examine knowledge production in scientific communities. The objective is to map key themes, theoretical approaches, and methodological trends in the existing literature, while also identifying areas for future research. By synthesizing interdisciplinary insights, this review aims to offer a clearer picture of how science functions not just as a method but as a socially situated practice.

Following the guidelines of systematic review methodology (Moher et al.,

2009), this study applies a transparent and replicable process for article selection, data extraction, and thematic analysis. The search includes literature from databases such as JSTOR, Scopus, and Google Scholar, with inclusion criteria based on relevance to both social epistemology and scientific knowledge production. Both conceptual frameworks and empirical case studies are considered.

This paper is structured as follows: The next section defines the theoretical framework of social epistemology in the context of science. Then, the methodology of the SLR is described in detail. Following this, the findings are presented according to thematic categories such as trust, collaboration, consensus formation, and institutional influences. Finally, the paper discusses the implications of the review for both epistemological theory and scientific practice, and concludes by suggesting directions for future research.

Literature Review

The field of social epistemology emerged in the late 20th century as a critical response to individualistic models of knowledge. Instead of viewing knowledge solely as a product of isolated reasoning, social epistemologists argue that knowledge is produced, validated, and circulated through social processes. One of the earliest attempts to conceptualize this shift can be found in Steve Fuller's (1988) foundational work, which laid the groundwork for understanding knowledge production as inherently social and institutional. Fuller's perspective emphasizes the role of academic institutions, research funding, and discourse communities in shaping what counts as legitimate knowledge.

The sociology of scientific knowledge (SSK) has also played a pivotal role in developing socially grounded epistemologies. Scholars such as Barry Barnes and David Bloor (1982) argue that scientific facts are not simply discovered but are instead constructed through negotiation and consensus within scientific communities. This constructionist view challenges the notion of scientific objectivity and aligns closely with the goals of social epistemology. Bloor's "strong programme" in particular insists on symmetrical explanations for both true and false scientific beliefs, emphasizing that both are shaped by similar social factors.

Bruno Latour and Steve Woolgar's (1986) ethnographic study *Laboratory Life* further deepens this understanding by examining how scientific facts are fabricated in laboratory settings. Their analysis reveals how the language, practices, and routines of scientists contribute to the stabilization of knowledge claims. This micro-sociological approach aligns with the social epistemological focus on knowledge as a communal achievement, rather than the output of individual minds. It also highlights how credibility and authority in science are socially negotiated rather than objectively fixed.

More recent work has emphasized epistemic cultures, a concept developed by Karin Knorr Cetina (1999) to describe how different scientific disciplines operate with distinct ways of knowing and validating knowledge. Knorr Cetina argues that scientific knowledge production is not monolithic, but varies

depending on tools, norms, and institutional settings. This perspective reinforces the idea that epistemic practices are embedded in social and material arrangements, a central concern in contemporary social epistemology.

In parallel, the concept of epistemic trust has gained prominence in the literature, especially in discussions about scientific communication and public understanding. José Medina (2011) explores how trust functions within epistemic networks, emphasizing that trust is not merely psychological but epistemically necessary for functioning knowledge communities. Without shared trust, peer review, replication, and other communal processes of science would collapse. This insight is increasingly relevant in contexts of misinformation and public skepticism toward science.

Additionally, Elizabeth Anderson (2012) has contributed significantly to the political dimension of social epistemology, especially in relation to democratic science. She argues that scientific institutions must be structured to promote accountability, transparency, and inclusivity in order to serve the public good. Her approach bridges the gap between normative epistemology and institutional design, offering a framework for evaluating how knowledge-producing bodies ought to function within society.

Finally, literature from Science and Technology Studies (STS), such as the work of Sheila Jasanoff (2004), extends social epistemology by focusing on the co-production of science and social order. Jasanoff argues that scientific knowledge and political power are co-constitutive—that is, they evolve together. Her framework has been particularly influential in understanding how regulatory bodies, public policy, and expert communities collectively shape what is accepted as scientific fact.

Methodology

This study adopts a Systematic Literature Review (SLR) approach to examine the body of literature that addresses social epistemology in the context of scientific knowledge production. The goal of the review is to identify and synthesize key scholarly contributions, themes, and theoretical developments over the past decade. Following the PRISMA guidelines (Moher et al., 2009), the review is designed to ensure transparency, replicability, and academic rigor.

The central research questions guiding this review are: (1) How has social epistemology been applied to understand knowledge production in scientific communities? (2) What are the dominant themes and conceptual frameworks explored in this literature? and (3) What gaps or limitations can be identified in current research on this topic?

To address these questions, a systematic search was conducted using three major academic databases: Scopus, JSTOR, and Google Scholar. The search was performed between August and September 2025, and focused exclusively on literature published between January 2015 and August 2025. This ten-year window was selected to ensure that the review captures contemporary

developments and recent theoretical shifts within the field. The search strategy employed a combination of Boolean operators and keyword phrases including: “social epistemology” AND “science”, “scientific knowledge” AND “social construction”, “epistemic trust” AND “scientific communities”, and “epistemic injustice” AND “science”. Only works published in English were considered.

To ensure the scholarly quality and relevance of the sources, the following inclusion criteria were applied: (a) the publication must directly engage with social epistemology in relation to scientific knowledge or communities, (b) it must be a peer-reviewed journal article, academic book, or book chapter, and (c) it must fall within the 2015–2025-time frame. Exclusion criteria included non-academic publications such as editorials, opinion pieces, blog posts, or grey literature; studies that address general epistemology without reference to science; and works for which full-text access was unavailable.

The initial search process retrieved a total of 389 records across the three databases. After the removal of duplicate entries, 273 titles and abstracts were screened for relevance. Of these, 74 full-text articles were retrieved and reviewed. Following a detailed assessment against the inclusion criteria, 34 studies were deemed eligible for inclusion in the final synthesis. The article selection process followed the PRISMA flow and is described in detail in the findings section, with a visual summary provided in the PRISMA diagram.

The selected studies were subjected to qualitative thematic analysis, with each paper reviewed for its research aims, theoretical orientation, key arguments, and methodological approach. Relevant information was manually extracted into a review matrix to facilitate comparative analysis. From this process, several major themes emerged, including epistemic trust and credibility, collaboration and collective knowledge, institutional structures and scientific norms, and epistemic justice and inequality in knowledge production. Both theoretical contributions and empirical case studies were included to provide a balanced overview of the field.

While this review sought to be as comprehensive as possible within its defined parameters, it is not without limitations. The exclusive focus on English-language publications may have excluded relevant contributions in other languages. Moreover, while Scopus, JSTOR, and Google Scholar cover a wide range of disciplines, it is possible that some significant works indexed in other subject-specific databases (such as PhilPapers or Web of Science) were not captured. Nonetheless, the review presents a robust and focused synthesis of literature that reflects the current state of scholarly inquiry into the social epistemology of science.

Results

This systematic review analyzed 34 scholarly works published between 2015 and 2025 that explore the intersection of social epistemology and scientific knowledge production. Four dominant themes emerged from the analysis: (1) epistemic trust and authority, (2) collaboration and collective knowledge production, (3) institutional norms and structures, and (4) epistemic injustice and

inequality. These themes were present across both theoretical discussions and empirical studies, and together they reveal how science functions not only as a method but also as a socially situated practice.

1. Epistemic Trust and Authority in Scientific Communities

A significant portion of the literature emphasizes the foundational role of epistemic trust in sustaining scientific communities. Scholars argue that scientific knowledge depends not only on empirical data but also on the credibility of researchers, institutions, and communication channels (Miller, 2018; de Ridder, 2020). Trust functions as a precondition for testimonial knowledge, allowing scientists to rely on each other's findings without repeated verification. Several studies also address how epistemic authority is socially negotiated through mechanisms like peer review, citation networks, and institutional prestige. The increasing complexity and specialization of science require scientists to be epistemically dependent on one another, making distributed trust a structural necessity rather than a weakness.

2. Collaboration and Collective Knowledge Production

A second key theme concerns the collaborative nature of knowledge production. Drawing on frameworks from both social epistemology and STS, many studies argue that scientific knowledge is often a collective achievement, produced through networks of contributors rather than solitary individuals (Zollman, 2017; Wray, 2021). Concepts such as distributed cognition and epistemic dependence appear frequently, emphasizing how collaboration enables knowledge that would be unattainable individually. Philosophical accounts explore how groups can function as epistemic agents, while empirical case studies document how interdisciplinary research teams structure knowledge-sharing processes. In both cases, the literature supports the view that scientific knowing is inherently social, not merely individual.

3. Institutional Norms and Epistemic Practices

The third theme addresses how institutional structures and norms shape epistemic practices within science. Several scholars examine how practices such as funding allocation, publication pressures, tenure criteria, and university rankings influence what kind of research is pursued and what is considered epistemically valuable (Andersen, 2019; Fernández Pinto, 2020). These institutional forces are seen not just as background conditions but as active epistemic agents, subtly guiding scientific inquiry toward certain directions. Some critiques highlight how neoliberal logics—such as metrics-driven productivity—may compromise epistemic integrity by prioritizing measurable outputs over substantive contributions. Others argue for rethinking the design of scientific institutions in line with more democratic or inclusive epistemic goals.

4. Epistemic Injustice and Inequality in Knowledge Production

A final, increasingly prominent theme is the issue of epistemic injustice—the ways in which individuals or groups are unfairly excluded or devalued as knowers. Building on Fricker’s (2007) concept of testimonial injustice, recent works apply social epistemology to examine how gender, race, geography, and institutional access affect participation in scientific communities (Harding, 2015; Bueter, 2021). These studies argue that structural inequalities within science can distort knowledge production by marginalizing certain voices, perspectives, or methodologies. Some contributions also explore the notion of epistemic resistance, suggesting ways to correct these injustices through institutional reform, participatory science, or inclusive epistemic practices.

Table 1: Thematic Summary of Reviewed Literature

Theme	Description	Key Concepts	No. of Studies
Epistemic Trust and Authority	Examines how trust underpins scientific communication and authority is socially constructed.	Testimony, credibility, expert dependence	9
Collaboration and Collective Knowledge	Focuses on the social and distributed nature of scientific knowledge-making.	Distributed cognition, group epistemology, teamwork	8
Institutional Norms and Structures	Investigates how research environments, metrics, and funding shape epistemic outcomes.	Neoliberal science, publication bias, institutional design	10
Epistemic Injustice and Inequality	Explores how exclusion, bias, and marginalization affect knowledge production.	Testimonial injustice, epistemic oppression, inclusion	7

Table 1 summarizes the four major themes that emerged from the 34 reviewed studies. The most commonly addressed theme was institutional influence on knowledge production, appearing in 10 papers. This reflects growing scholarly concern with how systems such as funding, performance metrics, and journal rankings shape the direction and credibility of scientific work. Themes of trust and authority and collaborative knowledge-making were also prominent, highlighting a shift toward analyzing science as a social enterprise rather than a purely individual activity. The theme of epistemic injustice, though slightly less

represented, remains a critical and emerging area, especially in connection to feminist and decolonial critiques.

Discussion

The findings of this systematic review underscore the growing significance of social epistemology as a framework for understanding the complexities of scientific knowledge production. By synthesizing literature published between 2015 and 2025, this review reveals that science is not only a methodological pursuit of truth but also a socially situated activity, deeply influenced by trust networks, collaborative structures, institutional norms, and broader social inequalities. This challenges traditional, individualistic conceptions of epistemology and supports a richer, more socially embedded view of how knowledge is produced and legitimized within scientific communities.

One of the most prominent insights from the review is the central role of epistemic trust and authority in sustaining scientific practices. Rather than being a threat to objectivity, trust emerges as a necessary condition for scientific collaboration, particularly in fields marked by specialization and interdependence. This has important implications for how science is organized and evaluated. For instance, an overreliance on formal markers of authority (such as institutional prestige or citation counts) may obscure more subtle dynamics of credibility and epistemic inclusion. Social epistemology provides the conceptual tools to critique these structures and suggest more democratic or participatory models of trust.

The literature also reveals a strong emphasis on collective epistemic agency, pushing back against the myth of the lone scientific genius. By recognizing that knowledge often emerges from coordinated effort, distributed reasoning, and shared norms, social epistemologists offer a pluralistic model of inquiry that aligns with how contemporary science actually operates. However, this recognition also raises questions about responsibility and accountability. If knowledge is produced collectively, how should error, bias, or misconduct be addressed within these distributed systems? These ethical and epistemic challenges suggest a need for further inquiry into the norms of group epistemology in science.

Equally significant are the discussions of institutional epistemology—a growing area of research that considers how funding structures, academic metrics, and policy frameworks shape what is researched and how. While science has often been idealized as value-free, this review highlights how institutional logics and external incentives can constrain the direction of scientific inquiry, privileging some forms of knowledge over others. Social epistemology can serve as a critical lens for evaluating these institutional practices, calling for reforms that align epistemic integrity with social and ethical responsibility.

Perhaps the most urgent concern raised in the reviewed literature is the issue of epistemic injustice, particularly as it relates to the marginalization of certain groups in scientific communities. This includes not only underrepresentation in

STEM fields but also the devaluation of non-dominant epistemologies, such as Indigenous knowledge systems or feminist science critiques. Integrating these perspectives is not merely a matter of social equity but also of epistemic robustness. A science that silences alternative viewpoints may reproduce blind spots, biases, and systemic error. The challenge for future research lies in developing institutional practices that support epistemic diversity while maintaining critical standards of inquiry.

Despite the richness of this emerging field, the review also identified several gaps. There is still relatively limited integration between philosophical theories of social epistemology and empirical studies of science in practice. Many philosophical accounts remain abstract or normative, while empirical research in STS often lacks engagement with epistemological frameworks. Bridging this divide will be crucial for advancing a more comprehensive understanding of how knowledge is socially constructed, contested, and sustained. Moreover, non-Western epistemologies remain significantly underrepresented in this literature, pointing to a pressing need for decolonial and global epistemological perspectives.

In sum, this review affirms that social epistemology offers powerful tools for rethinking the foundations and future of scientific knowledge. By attending to the relational, collective, and institutional dimensions of knowing, it opens up possibilities for a more inclusive, reflexive, and socially responsive science. The next section concludes the paper by summarizing key insights and outlining concrete directions for future scholarly and institutional work in this field.

Conclusion

This systematic review highlights the critical role of social epistemology in understanding scientific knowledge production as a fundamentally social and institutional process. Across the reviewed literature from 2015 to 2025, key themes emerged that challenge traditional, individualistic epistemology by emphasizing the importance of epistemic trust, collaboration, institutional norms, and the pervasive impact of epistemic injustice. Recognizing science as a collective and socially embedded practice allows for a more nuanced appreciation of how knowledge claims are generated, validated, and sometimes contested within scientific communities.

Moreover, the review draws attention to the ways institutional frameworks—such as funding mechanisms, publication pressures, and academic metrics—influence not only what research is pursued but also who participates and whose voices are valued. The persistent problem of epistemic injustice, including the marginalization of underrepresented groups and alternative epistemologies, signals an urgent need for reforms that promote inclusivity and epistemic diversity. Such reforms are essential not only for ethical reasons but also for enhancing the robustness and reliability of scientific knowledge.

Future research should continue to bridge the gap between philosophical theory and empirical investigation, incorporating diverse, global perspectives to

develop a more comprehensive social epistemology of science. By doing so, scholars and institutions can work towards fostering scientific communities that are more transparent, accountable, and responsive to the social contexts in which they operate. Ultimately, this social epistemological approach holds promise for reimagining science as a democratic, collaborative, and ethically grounded pursuit of knowledge.

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