

The Relationship between Epistemology and Phenomenology in Developing the Concept of Philosophy of Science

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Abstract

This study aims to explore the role and interrelationship between epistemology and phenomenology within the framework of the philosophy of science, particularly in the context of education. Epistemology, as a branch of philosophy that addresses the nature, sources, structure, and validity of knowledge, provides a theoretical foundation for understanding scientific thinking and knowledge construction. Meanwhile, phenomenology emphasizes direct experience and subjective consciousness as a means of understanding reality—an essential aspect for deeply comprehending individual learning experiences in educational practice. Although differing in approach—epistemology being analytical and normative, while phenomenology is descriptive and intuitive—both complement each other in offering a comprehensive perspective on the dynamics of scientific knowledge. The integration of epistemology and phenomenology in the philosophy of science opens space for a more holistic understanding, where the objectivity of scientific knowledge is enriched by the subjective meaning derived from human experience. This approach is highly relevant in contemporary education, as it bridges the gap between theory and practice, between structured knowledge and personal learning experiences. Therefore, this study underscores the importance of an interdisciplinary approach in the development of scientific knowledge and humanistic educational practices.

Keywords: Epistemology, Phenomenology, Philosophy of Science, Education

Abstrak

Kajian ini bertujuan untuk mengeksplorasi peran serta hubungan antara epistemologi dan fenomenologi dalam kerangka filsafat ilmu, khususnya dalam konteks pendidikan. Epistemologi sebagai cabang filsafat yang membahas hakikat, sumber, struktur, dan validitas pengetahuan, memberikan landasan teoritis dalam memahami proses berpikir ilmiah dan konstruksi pengetahuan. Sementara itu, fenomenologi menekankan pada pengalaman langsung dan kesadaran subyektif sebagai sarana memahami realitas, yang dalam praktik pendidikan sangat penting untuk memahami pengalaman belajar individu secara mendalam. Meskipun memiliki pendekatan yang berbeda—epistemologi bersifat analitik dan normatif, sedangkan fenomenologi bersifat deskriptif dan intuitif—keduanya saling melengkapi dalam memberikan perspektif yang utuh terhadap dinamika ilmu pengetahuan. Integrasi epistemologi dan fenomenologi dalam filsafat ilmu membuka ruang bagi pemahaman yang lebih holistik, di mana objektivitas pengetahuan ilmiah diperkuat oleh pemaknaan subyektif yang berasal dari pengalaman langsung manusia. Pendekatan ini memiliki relevansi yang tinggi dalam pendidikan kontemporer karena mampu menjembatani antara teori dan praktik, antara pengetahuan yang terstruktur dan pengalaman belajar yang bersifat personal. Dengan demikian, kajian ini menegaskan pentingnya pendekatan interdisipliner dalam pengembangan ilmu pengetahuan dan praksis pendidikan yang humanistik.

Kata Kunci: Epistemologi, Fenomenologi, Filsafat Ilmu, Pendidikan

A. Introduction

The philosophy of science plays an important role in providing a deeper understanding of the basic concepts of science. Essentially, the philosophy of science is not only about what science is, but also about how science is developed, tested, and applied in human life. (Dewi 2021) The two main branches of philosophy of science, epistemology and phenomenology, take different but complementary approaches to understanding the nature of knowledge. Epistemology, derived from the Greek words episteme (knowledge) and logos (science or research), is a branch of philosophy that focuses on the sources, limits, and validity of knowledge (Ridlo 2020). Epistemology reveals how knowledge is acquired, including through reason, experience, and social construction (Ulin, Latifah, and Nafisa 2022). This perspective is important in the philosophy of science because it helps validate

scientific methods and determine what is considered reliable knowledge. According to Suadi, epistemology also includes an understanding of the justification or validation of knowledge and plays an important role in distinguishing between justified and unfounded beliefs (Tryana Pipit Mulyah 2020).

On the other hand, phenomenology, developed as a philosophical approach, focuses on how individual subjective experiences are directly experienced. As the protagonist of phenomenology, Husserl explained that phenomenology aims to understand human experience as it is, without additional assumptions or preliminary interpretations (Shafira et al. 2025). Phenomenology provides an alternative view of knowledge by exploring life experiences and emphasizing the importance of understanding phenomena from an individual perspective. In the context of education, the phenomenological approach can provide deeper insights into how students experience the learning process, thereby enabling the development of more effective learning strategies (Syukur 2025).

Integrating epistemology and phenomenology into the philosophy of science helps create a more holistic view, in which epistemology provides a rational foundation and phenomenology adds a subjective dimension to experience. These two perspectives enable a more comprehensive approach to science, especially in understanding the complexity of the interaction between objective knowledge and subjective perception (Azzarah, Nurwahidin, and Sudjarwo 2022). Therefore, epistemology and phenomenology are not only two independent approaches, but also complementary foundations for the development of a philosophy of science that can encompass various aspects of human experience.

The philosophy of science is the mother of all knowledge. Philosophy is a comprehensive system of thought about the pure state and reality that occurs in life. Philosophy can also be used as an integral part of life. This is because the things that fall within the scope of philosophy always contain something fundamental and require recognition. The introduction discusses the importance of epistemology and phenomenology in education and how the two can complement each other in forming concepts in the philosophy of science. Epistemology considers the origin, validity, and limitations of knowledge, while phenomenology focuses on deep subjective experience. Both are important for understanding the concepts of the philosophy of science in depth, especially in the context of modern education (Patria and Salamah 2022).

Phenomenological philosophy is the theoretical perspective or philosophical view behind the methodology that was integrated into constructivist epistemology (interpretivism) by Michael Crotty and, in contrast to positivist philosophy, was born from the attempt to understand the relationship between explaining social reality. (Utomo, Darmuki, and Surachmi 2024)

B. Methods

Is my writing in line with this research method? This research uses a qualitative approach with a philosophical library research method. This approach focuses on critically and deeply analyzing the relationship between epistemology and phenomenology in the development of the concept of philosophy of science, particularly in the context of education. This type of research is based on a hermeneutic-philosophical paradigm, where the data analyzed is sourced from secondary literature such as the works of philosophical figures (Edmund Husserl, Immanuel Kant, Karl Popper), academic books, scientific journal articles, and other relevant scientific writings. Data collection techniques were carried out through documentation, namely selecting, reading, and analyzing the contents of documents to identify concepts, arguments, and the relationship between the two philosophical approaches.

C. Result and Discussion

Initially, phenomenology was a school of thought in philosophy, and today it is always associated with its main figure, Edmund Husserl. However, the term “phenomenology” was not actually coined by Edmund Husserl. It often appeared in philosophical discourse as early as 1765, and sometimes appeared in the works of the philosopher Immanuel Kant (Tryana Pipit Mulyah, Dyah Aminatun, 2020). In this discussion, the meaning of the term phenomenology has not yet been formulated in a concrete and clear manner. The meaning of the word “phenomenology” became clear only when Hegel formulated it. Hegel defined phenomenology as “knowledge that arises in consciousness” (Hakim 2024).

Linguistically, epistemology comes from the Greek words *episteme*, meaning “knowledge,” and *logos*, meaning “science.” Conceptually, epistemology is the science that studies the sources, methods, and structure of knowledge and its truth. Epistemology is defined as a branch of philosophy concerned with the nature and scope of knowledge, its foundations, and the identification of knowledge. Ajmardi Azra adds that epistemology is the science that discusses the reliability, understanding, structure, methods, and validity of science. Therefore, epistemology is the science that investigates questions related to knowledge and considers its content R. S Dewi, (2021).

1. Epistemological Concepts in the Philosophy of Science

Epistemology in the philosophy of science is a branch of philosophy that discusses the nature, sources, and limitations of scientific knowledge. The term “epistemology” itself comes from the Greek words ‘*episteme*’ (knowledge) and “*logos*” (study or knowledge), and literally means the study of knowledge. In the philosophy of science, epistemology plays a crucial role in explaining how humans arrive at reliable and true knowledge (Dewi 2021).

Epistemology plays an important role in the philosophy of science as a field that studies the sources, foundations, and limitations of scientific knowledge. In general, epistemology aims to understand how knowledge is obtained and used as truth. According to Dewi, epistemology seeks to define what knowledge is, how to obtain it, and consider its effectiveness and limitations in producing objective truth. (Zahro 2023) The basic concepts of epistemology relate to fundamental questions such as: (Yusuf Seknun, 2017)

a. What is knowledge?

Epistemology seeks to define what is meant by “knowledge.” Knowledge is usually considered to be justified true belief. However, this definition continues to be revised, especially when challenges such as the Gettier problem arise, which suggest that knowledge may be more complex than simply justified true belief. Epistemology considers knowledge to be justified true belief. However, this definition has evolved, especially after the emergence of questions such as the Gettier problem, which questions whether knowledge can be limited to justified belief (Sari 2021).

b. How can we acquire knowledge?

Epistemology encompasses various theories about the sources of knowledge, including rationalism (knowledge is obtained through reason), empiricism (knowledge is obtained through experience), and constructivism (knowledge is constructed by individuals or society). Each of these approaches offers a different perspective on how people understand the world and construct knowledge. Epistemology recognizes various theories about the origin of knowledge, such as rationalism, empiricism, and constructivism. According to Mulyah et al, the rationalist view argues that knowledge is obtained through reason, while empiricism emphasizes experience as the main

source of information. In contrast, constructivism emphasizes that knowledge is the result of individual or social construction (Pipit Mulyah, 2020).

c. What are the limits of knowledge?

Epistemology also investigates the limits of human knowledge. Questions such as whether there is anything that cannot be known and to what extent one can rely on scientific methods in the search for truth are part of the epistemological debate.

d. The Theory of Truth in Epistemology

The concept of truth is a core element of epistemology. Truth theories include correspondence theory (truth corresponds to reality), consistency theory (truth is consistency within a belief system), and pragmatic theory (truth is what actually works)

In the philosophy of science, epistemology helps provide a framework for understanding and developing valid scientific knowledge. Epistemology also forms the basis for evaluating scientific methods and criteria for distinguishing scientific discoveries from beliefs and opinions that are not based on strong evidence. This epistemological approach forms the foundation for the development of methodology in science and emphasizes the importance of a critical attitude in the application of science.

2. Phenomenology and Its Influence on Science

Phenomenology is a philosophical approach that focuses on understanding human subjective experiences when encountering various phenomena. Phenomenology, developed by Edmund Husserl, focuses on how phenomena are directly experienced by individuals, without additional assumptions or interpretations, with the aim of “understanding everything as it is.” (Assingily, Putro, and Sirait 2020).

The impact of phenomenology on science is very important, especially in the social sciences, humanities, and education, because phenomenology provides a way to contextualize a deep understanding of human experience. In science, phenomenology helps researchers consider subjective factors and individual perspectives, not just objective data. This leads to a more comprehensive understanding of social, cultural, and psychological phenomena (Dewi 2021).

For example, in the social sciences, qualitative research often uses a phenomenological approach to explore the experiences of individuals or groups in greater depth. Conversely, in the philosophy of science, phenomenology expands the epistemological framework by introducing aspects of experience and perception, thereby enabling a more comprehensive understanding of how science is constructed from a human perspective.

In the context of the philosophy of science, the integration of epistemology and phenomenology also opens up the possibility of broader scientific concepts that combine objective perspectives and subjective human experience. Thus, the philosophy of science not only tests knowledge logically, but also considers the human perception process in constructing scientific knowledge (Shafira et al. 2025).

Phenomenology makes an important contribution to the social sciences and humanities by emphasizing the importance of context and subjectivity. In education, the phenomenological approach helps educators gain a deeper understanding of students' experiences and gain insight into students' perspectives on the learning process (Landaburu, Phenomenology Of Practics).

3. The Relationship between Epistemology and Phenomenology in the Development of Philosophy of Science

In the philosophy of science, epistemology and phenomenology are closely related and

complement each other in the understanding and development of scientific concepts. Epistemology focuses on how we acquire knowledge and considers the basis of knowledge and the validity of existing beliefs and truths. Phenomenology, on the other hand, was developed by Edmund Husserl. (Islam and Banda 2025) It emphasizes how people experience reality directly, with the aim of identifying the “essence” of phenomena without hypothetical interpretation.

The relationship between the two depends on how phenomenology enriches epistemology. Phenomenology shifts the epistemological focus from merely analyzing the structure of knowledge to understanding how knowledge is experienced. In the philosophy of science, this phenomenological approach enables the development of more holistic knowledge by considering subjective experience as the basis for the construction of knowledge. By integrating phenomenology and epistemology, the philosophy of science not only evaluates the validity and foundations of knowledge but also examines the processes of perception and experience of objects.

This influence is particularly significant in the social sciences and humanities, where understanding individual experiences of specific phenomena provides broader insights. The phenomenological approach offers tools in epistemology to understand the relationship between objective reality and subjective experience, thereby opening space for more inclusive scientific concepts that incorporate human aspects in scientific observation.

Epistemology and phenomenology have a complementary relationship in the philosophy of science, particularly in understanding broader scientific concepts. While epistemology seeks to test and evaluate the foundations of knowledge through rational analysis, phenomenology enriches this perspective with an approach focused on subjective experience. According to Seknun, phenomenology can add a further dimension to epistemology, namely by emphasizing how knowledge is experienced and structured based on human perception. (Seknun 2017) This relationship makes the philosophy of science more holistic and humanistic, especially in the context of social sciences and humanities, and understanding individual experiences allows for more in-depth analysis of social and cultural data (Zahro 2023).

In the context of philosophy of science, the integration of epistemology and phenomenology also opens up the possibility of broader scientific concepts that combine objective perspectives and subjective human experiences. In this way, philosophy of science not only tests knowledge logically, but also considers the human cognitive process in constructing scientific knowledge (an Fauziya Rozani Syafei and Alkalah 2020).

D. Conclusion

The connection between epistemology and phenomenology in the philosophy of science creates a more comprehensive view of the understanding of science. Epistemology focuses on how knowledge is acquired, verified, and justified. It examines the rational basis of knowledge and tests the validity of beliefs and concepts of truth. On the other hand, phenomenology, developed by Edmund Husserl, focuses on the direct and subjective experience of individuals in understanding phenomena without prior assumptions.

The combination of these two approaches allows the philosophy of science to provide an understanding that values not only objective experience but also subjective experience. In the context of education, the epistemological perspective helps build a reasonable scientific method, while phenomenology allows for a deeper understanding of the learning process from an individual's point of view. Therefore, the combination of epistemology and phenomenology can lead to the development

of a more holistic science that encompasses both objective knowledge and the subjectivity of human experience.

E. References

- an Fauziya Rozani Syafei, and Cynthia Alkalah. 2020. *Buku Dasar-Dasar Filsafat*. Vol. 19.
- Assingkily, Muhammad Shaleh, Khamim Zarkasih Putro, and Sangkot Sirait. 2020. "Kearifan Menyikapi Anak Usia Dasar Di Era Generasi Alpha (Ditinjau Dari Perspektif Fenomenologi)." *Attadib Journal Of Elementary Education* 3 (2): 2019. <https://doi.org/10.9744/scriptura.5.2.52->
- Azzarah, Mia., Muhammad Nurwahidin, and Sudjarwo. 2022. "Ilmu Pendidikan Di Indonesia Dalam Persektif Filsafat Ilmu." *Journa of Innovation and Knowledge* 2 (6): 2551–60. <https://bajangjournal.com/index.php/JIRK/article/view/4010%0Ahttps://bajangjournal.com/index.php/JIRK/article/download/4010/2944>.
- Dewi, R. S. 2021. "Ilmu Dalam Tinjauan Filsafat: Ontologi, Epistemologi, Dan Aksiologi." *CENDEKIA: Jurnal Studi Keislaman* 7 (2): 177–83.
- Hakim, Adnan. 2024. "Fenomenologi Digital: Dari Realitas Virtual Menuju Konsep Pengetahuan Baru." *Filsafat Digital* 2, no.
- Islam, Universitas, and Negeri Ar-raniry Banda. 2025. "Filosofi Fenomenologi Metode Reduksi Husserl" 9: 11194–200.
- Landaburu, Jon. 2016. *濟無No Title No Title No Title*. Vol. 4.
- Patria, Rida, and Salamah. 2022. "Studi Fenomenologi: Teori Humanistic Dalam Pembelajaran Ilmu Pengetahuan Sosial." *Progressive of Cognitive and Ability* 1 (1): 1–9. <https://doi.org/10.56855/jpr.v1i1.1>.
- Pipit Muliayah, Dyah Aminatun, Sukma Septian Nasution, Tommy Hastomo, Setiana Sri Wahyuni Sitepu, Tryana. 2020. "濟無No Title No Title No Title." *Journal GEEJ* 7 (2).
- Ridlo, Rasyid. 2020. "Penerapan Epistemologi Bayani Dan Burhani Sebagai Metode Pembelajaran." *Manbajuna: Jurnal Pendidikan Agama Islam* 01 (01): 19–37. <http://jurnal.uin-antasari.ac.id/index.php/syariah/article/view/217/173>.
- Sari, Nurul Aini. 2021. "Pendekatan Fenomenologi Dalam Pendidikan Humanistik." *Jurnal Pendidikan Dan Filsafat* 4, no.
- Seknun, Yusuf. 2017. "Filsafat Kurikulum Dan Pengajaran." *Inspiratif Pendidikan* 6 (2): 245. <https://doi.org/10.24252/ip.v6i2.5225>.
- Shafira, Nureka Agisna, Aulia Rahmawati, Arya Valenta, Dhea Desvita Juniati, and Yuli Maria. 2025. "Studi Fenomenologi Darurat Konten Negatif Pada Peserta Didik Di SMAN 7 Mataram" 10: 576–83.
- Syukur, Muhammad. 2025. "Integrasi Nilai-Nilai Filsafat Ilmu Untuk Penguatan Literasi Dan Berpikir Kritis Di Kalangan Generasi Z" 07 (02): 9831–37.
- Ulin, Nihayah, Misya'ul M. U. Latifah, and Amaliya Nafisa. 2022. "Sultan Idris Journal of Psychology and Education." *Sultan Idris Journal of Psychology and Education* 1 (2): 1–14.
- Utomo, Erry, Agus Darmuki, and Sri Surachmi. 2024. "Peran Epistemologi Filsafat Dalam Mengembangkan Berpikir Kritis Bagi Anak Sekolah Dasar." *Edukatif: Jurnal Ilmu Pendidikan* 6 (4): 3033–47. <https://doi.org/10.31004/edukatif.v6i4.6831>.
- Zahro, Lutfia Nur. 2023. "Fenomenologi Trauma Pada Anak: Kajian Dalam Pendekatan Kualitatif." *Pilar Nusantara*.