



PROOF OF TRUTH IN INDUCTIVISM THEORY

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Abstract :

This research discusses truth that can be proven through inductivism theory. The questions in this research include aspect of what is truth? what is theory of inductivism? and how inductivism theory works in proving truth?. This research uses qualitative methods to explore the meaning of the text. The primary sources are books about truth and inductivism theory such as Paul Wahana's Philosophy of Science, then secondary data as support such as articles related to truth and inductivism theory. This research focuses on analyzing inductivism theory in proving truth. This article tries to explore the position of truth through inductivism theory. Can it be proven to be true? And how inductivism theory proves it. It turns out that the analysis of inductivism theory in proving truth or forming knowledge through scientific methods contains many criticisms. However, this criticism must be seen as a guide to finding alternative solutions to overcome the weaknesses of induction. Criticism of induction can also be interpreted as a form of criticism of science as a whole. The limitations of the induction method in science reveal that scientific truth is not the only type of truth that exists.

Keywords: Inductivism, Truth, Theory.

INTRODUCTION

Philosophy has once again taken on a conspiratorial tone. In some cases, this is seen as a rebellion against the established order. In fact, everything becomes clear through philosophy. For, if genius minds do not actively seek truth, the universe and its contents are, in essence, meaningless. This is why knowledge is needed. History records that humans have always harnessed their potential to attain truth, both from external sources and internal reflection. This approach has given rise to various methods that serve as tools for obtaining objective truth. Epistemologically, truth is defined as the correspondence between knowledge claims and the reality that is the object of knowledge, which can be achieved through the use of reasoning methods, particularly inductive reasoning. Inductive reasoning begins with specific events based on empirical observation and concludes with general conclusions or knowledge. However, upon closer examination, this method of inductive reasoning has attracted various criticisms.

The inductive approach is typically rooted in empirical thinking, supported by methodological tools such as experiments, observations, and sensory perception. In the Islamic academic tradition, experimental and observational methods have been more widely applied in the exact sciences, including astronomy, geodesy, metallurgy, optics, and medicine. This paradigm heavily relies on a posteriori reasoning based on the results of observations of phenomena or experiences. Since the late stages leading into the Age of Enlightenment, the inductive paradigm began to form the foundation of



scientific knowledge in the Western world, particularly after Francis Bacon introduced the scientific method he called *novum organum*. Bacon, a prominent philosopher, argued that the primary goal of science was to enable humans to dominate nature. According to him, science must possess a practical nature that strengthens human control over the universe. With science, humans are able to conquer nature. Therefore, the motto of Plato, "knowledge is power," became a principle deeply ingrained in Bacon's perspective (Setianingsih, 2020).

Bacon further stated that, up until his time, science and scientists had tended to strive too hard to control and manipulate nature to align with human desires. The approach to nature was not based on the nature of the world itself, but rather adjusted to human wishes and assumptions. In this regard, nature was forced to conform to human perspectives and was not presented as it truly was; it was always seen through the lens of human thought. From this perspective, it can be said that humans often impose a certain order on nature, even though such an order may not actually exist. (A. Sonny, 2001). Bacon also believed that traditional science was incapable of producing progress or creating innovations beneficial to life. Based on this view, Bacon developed a new method as a critique of the Aristotelian deductive method used by his predecessors. Additionally, he criticized the rationalists, who prioritized reason over the role of the senses in discovering truth. According to Bacon, rationalists tended to have preconceived truths and conclusions in their minds, and then attempted to force objects to conform to those ideas.

Bacon can be considered a pioneer who laid the foundation for the emergence of empiricism, which emphasizes that experience is the most reliable source of truth (Setianingsih, 2020). This understanding of empiricism was later adopted and further developed by Thomas Hobbes, George Berkeley, and David Hume, reaching its peak. John Locke argued that all other knowledge is obtained through the utilization and comparison of impressions received by the senses. He viewed the mind as a passive vessel, functioning to absorb the results of sensory perception (Maksum, M.Ag., M.Si, 2016). This led to the development of what is known as "modern induction," a logical systematization of scientific procedures. Bacon was not the first to introduce modern induction; however, there were earlier scholars who developed this method, which Bacon referred to as traditional induction. His ideas are now recognized as "Baconian Induction." Through this method, he hoped to enable humans to control the forces of nature through scientific discoveries. Bacon described this method in his book *Novum Organum*, published in 1620 (Maksum, M.Ag., M.Si, 2016).

Bacon introduced the inductive-empirical method as the most effective scientific approach to advance knowledge. In his famous work, *Novum Organum* (The New Organon), he offered a concept designed to replace the Aristotelian logic that had previously dominated scientific thinking in the *Organon* (Setianingsih, 2020). For Bacon, science was only valuable if it had practical applications that were beneficial, making his approach pragmatic and functional. Bacon's ideas on inductivism paved the way for many Western scientists such as Boyle, Newton, and John Locke, who continued this empiricist tradition. In the East, similar

ideas were also discussed by Sir Muhammad Iqbal in his classic work, *The Reconstruction of Religious Thought in Islam*. In this book, Iqbal emphasizes how Islam not only encourages a scientific spirit but also provides ample space to pursue truth through an inductive approach. He even stated that "the birth of Islam is the birth of inductive intellect," highlighting Islam's crucial role in shaping the tradition of scientific thinking ((Muhammad Iqbal, 2013). This study employs the inductive method to seek the truth of whether this is indeed the case.

RESEARCH METHOD

This research was conducted using a qualitative approach. This method was chosen based on its ability to abstract data through a schematic process to extract relevant values related to the study. This type of research is library research, which focuses on the search for sources such as books, articles, journals, and other texts. The data for this study comes from both primary and secondary sources. The primary data source used is the book *The Philosophy of Science* by Francis Bacon. Meanwhile, secondary data was obtained from various studies related to the subject matter of this research. The data was gathered from various sources and analyzed using descriptive analysis techniques.

FINDINGS AND DISCUSSION

Definition and Types of Truth

According to the *Kamus Besar Bahasa Indonesia* (KBBI), the word "kebenaran" (truth) comes from the root word "benar," which means fair, honest, and reliable, in accordance with reality. Grammatically, "kebenaran" is a noun formed from the adjective "benar" through a morphological process to function as a subject or object in a sentence, although it still reflects the original characteristic. Truth refers to a quality that aligns with facts or reality. Every step in the thinking process that results in a thought that can be expressed in a statement has the potential to lead to either truth or falsehood. Therefore, the quality of being true is closely related to the quality of knowledge obtained at each stage of the thinking process. (Wahana, 2016).

According to Abbas Hamami, the word "kebenaran" (truth) can be used as both a concrete and an abstract noun. When someone refers to truth, it means a true proposition, which refers to the meaning within a statement. (Dosen Filsafat Ilmu UGM, 2003). Truth is always related to human knowledge (the subject that knows) about the object. In other words, truth depends on how far the subject understands the object (Susanto, 2011). Truth is the characteristic of knowledge, and the truth of knowledge can be classified according to several criteria:

1. The truth of knowledge comes from various sources, such as empirical facts, revelation, or fiction. Each type of truth must be aligned with its source. For example, empirical truth must correspond to the empirical object that forms its basis.
2. The truth of knowledge is obtained through various methods, such as the senses (sensory truth), reason (intellectual truth), intuition (intuitive truth),

and faith (faith-based truth). Each type of truth must be aligned with the method used. For example, sensory truth (through vision) depends on the ability of the senses to perceive objects, taking into account their strengths and limitations. Vision provides information about color, size, and changes, but it is not always accurate, as seen in optical illusions, where a star that appears small is actually large, or parallel railway tracks appear to converge.

3. The truth of knowledge varies across different fields of life, such as religion, morality, art, culture, history, law, and politics. Each field has its own way of communication and understanding. For instance, the judgment of moral actions differs from the evaluation of works of art.
4. Knowledge is distinguished based on its levels: everyday knowledge, which is subjective; scientific knowledge, which produces scientific truth; and philosophical knowledge, which results in philosophical truth. Each type of knowledge has different standards of truth: everyday truth is based on experience, while scientific truth requires rational thinking to align with its object (Wahana, 2016).

Definiton of Induktivism

Inductivism can be understood as a process or an instrument. As a process, inductivism has two meanings: first, thinking from the specific to the general, such as "Ahmad will surely die, Ahmad is human, all humans die." Second, in scientific research, inductivism is a method of acquiring knowledge through real-world activities that are empirically tested. In inductive research, the process begins with field data, which then develops into a general theory, rather than starting from an existing theory (Hilmy, 2013).

Inductivism is a part of empiricism that emphasizes empirical observation. Naive inductivism assumes that scientific knowledge begins with observation, which provides a solid foundation for building scientific knowledge. Scientific knowledge is obtained from observation data through the process of induction. Similarly, understanding the laws of nature in everyday life is carried out through induction. For example, since childhood, we have witnessed the sun rising in the east. This happens every day, and the sun still rises in the east. This fact is a specific reality. From this experience, we conclude that "the sun rises in the east every day." The process of drawing this conclusion shows that specific facts can lead to general conclusions, which is an inductive conclusion. However, can we be certain that the sun will rise in the east tomorrow? No. We can only assume that the sun is likely to rise again in the east. This reflects the speculative nature of induction (Haryono Imam, 1991).

Empiricism emerged as a response to rationalism, which emphasizes reason as the source of knowledge. Empiricism has two main approaches: the meaning approach, which focuses on experience, and the knowledge approach, which emphasizes truth obtained through observation (aposteriori truth). Empiricist philosophers developed their views due to dissatisfaction with the methods of rationalism, which prioritize logical reasoning. John Locke argued that sensory experience is more important than deductive reasoning in the

development of knowledge and rejected the idea that knowledge is innate. According to him, the human mind at birth is like a blank slate, which is filled with sensory experiences.

In the early 17th century, alongside John Locke, Francis Bacon argued that to achieve truth, reason must start with specific sensory observations and move towards general conclusions. Bacon's thinking gave rise to the inductive method, where reasoning begins with specific events observed empirically and leads to general conclusions, in contrast to deductive reasoning. In fact, field research does not require complex concepts. It is sufficient to observe and draw generalizations from the phenomena at hand. In this context, theory is not a necessity; what matters more is the accuracy in observing and understanding the phenomena to make generalizations (Bagus, 1996).

In induction, the conclusion does not possess certainty of truth, only a level of probability of truth. According to Chalmers, for a generalization or inductive conclusion to be considered true and valid, several conditions must be met. The more observations that are made, under diverse conditions, and without contradicting universal laws, the stronger the truth of the conclusion becomes. However, the actual truth tends to lean towards probability. In other words, the truth based on inductive patterns is always tentative: it is assumed to be true until data shows otherwise (A. Sonny, 2001).

The Problematics of Induktivism

The limitations of inductivism in the scientific method are analyzed through criticisms against it. According to Honer and Hunt, as cited in Suriasumantri, there are three main criticisms of empiricism. *First*, experience, which serves as the foundation for inductivism, often does not directly relate to objective reality. Experience is not only a result of sensory perception but also involves judgment. Research shows that the concept of experience is unclear and insufficient as a basis for a systematic theory of knowledge. Furthermore, the connections between various issues often do not align with initial assumptions. *Second*, humans are heavily reliant on sensory perception to obtain facts and experiences of the real world. This dependency creates another weakness. Due to the limitations of human senses, perceptions of an object can be mistaken and misleading. For example, a straight stick, when submerged in water, appears to be bent. *Third*, inductivism essentially produces knowledge that is uncertain. Despite these weaknesses, the limitations of inductivism in the scientific method are analyzed through these criticisms. According to Honer and Hunt, as cited in Suriasumantri, there are three main criticisms of empiricism. First, experience, which serves as the foundation for inductivism, often does not directly relate to objective reality. Experience is not only a result of sensory perception but also involves judgment. Research shows that the concept of experience is unclear and insufficient as a basis for a systematic theory of knowledge (Achmad Charis Zubari, 1990).

According to Chalmers, inductive reasoning is not always logically valid. Even if the premises are true, the conclusions drawn can still be incorrect. For example, if one observes a large number of crows in different conditions and

concludes that all crows are black, then announces that all crows are black, this appears to be a reasonable inductive conclusion. However, there is no guarantee that crows do not have other colors. The conclusion would be incorrect if it is proven that there are crows that are brown or pink. Inductive reasoning in empiricism and inductivism does not guarantee precise accuracy. Even if it is based on repetition, the generalizations made are still difficult to prove. For example, a chicken learns that food always arrives when the owner comes. However, when the owner arrives with a knife, the chickens realize that the owner's arrival does not always mean food, but also means danger. The conclusion that the owner always brings food becomes a misleading and harmful piece of knowledge that could mislead the chicken (Hendrik Rapar, 1996).

Similarly, our belief that the sun rises from the east is based on observation, and while the sun rises from this direction every day, it does not always rise exactly from the east. It might shift slightly to the north or south. There is still a possibility that the sun could rise from a different direction, such as the west, north, or south. This illustrates that scientific knowledge is not certain but rather probabilistic, or likely to be true. Therefore, there is logical evidence that inductive theories can lead to false conclusions. Something obtained through inductive reasoning may not be true, as seen in the case of the chicken, which believes the owner's arrival always means food, when in fact, it could signify a threat of death.

According to Hume, inductive theory often involves a direct or indirect relationship between two different events (A. Sonny, 2001). The conclusion drawn from inductive reasoning is often connected to causality or cause-and-effect relationships. For instance, if event B frequently occurs after event A, one might conclude that A causes B. Examples include deforestation causing floods or the Lapindo drilling resulting in mudflow. To illustrate further, consider two clocks—one chimes every hour and the other does not. When the silent clock shows 12 o'clock, the chiming clock chimes a few moments later, and this cycle repeats continuously. Can we conclude that the silent clock causes the chimes? While inductive reasoning can sometimes lead to false conclusions, such conclusions are still based on rational logic. Therefore, induction should not be considered erroneous, as the estimates or assumptions derived from it remain valid. Although we cannot definitively establish the truth of a theory or hypothesis through induction, we can affirm that it has not yet been proven wrong. This is a fundamental principle in scientific thinking: a theory or hypothesis is considered true as long as there is no evidence to refute it. Thus, induction plays a crucial role in the foundational development of scientific knowledge (Achmad Charis Zubari, 1990).

Analisis of Truth in Induktivism Theory

Francis Bacon outlined two steps in the search for truth through the inductive method. First, he suggested using reason or intellect to refer to specific sensory observations and then generalizing them. Second, he advocated for investigating these observations in order to uncover general knowledge that can

be inferred from experiments and the natural phenomena being studied (Haryono Imam, 1991).

The inductivist view on observation has two main assumptions. *First*, scientific knowledge (truth) begins with observation or fieldwork. *Second*, it is stated that observation can provide a strong foundation for acquiring knowledge (truth). Scientific observation must be conducted through human senses and tools that are appropriate for the needs of the research.

In this context, inductivists emphasize two points regarding visual observation. *First*, the observer can perceive the properties of objects in the external world as long as the information is recorded by the brain through the process of seeing. *Second*, ideally, two observers looking at the same object from the same position should obtain a similar view. However, in reality, this does not always occur. The experiences of two observers looking at the same object from the same location and under similar physical conditions do not always result in the same visual perception, even if the images received by their retinas are identical.

For example, there may be a photo that can be interpreted as a man blowing a whistle, or conversely, as a woman. The perception of this photo is subjective and relative, depending on the experience and socio-cultural background of each individual who views it. The experience of seeing is not only determined by what the retina captures but is also influenced by the observer's experiences, expectations, and knowledge. This serves as a critique of inductivists. Practical examples in science demonstrate that what is seen is a subjective experience, shaped not only by the eyes but also by factors such as knowledge, past experiences, and even psychological state. For instance, interpreting a photo may be easier for someone who has received training in that field and is only possible for those educated in that particular discipline (Setianingsih, 2020).

Theoretical support is necessary to strengthen the validity of observational statements. The stronger the validity, the broader the scope of the knowledge theory applied. This contrasts with the expectations of a naïve inductivist, who relies solely on observational data that has inductively proven to draw laws, rather than relying on theory. Furthermore, when conducting experiments, one may sometimes need to rely on the theories derived from research findings. Observations based on theory become a dependency, presenting challenges for naïve inductivists. However, modern inductivists have begun to shift this perspective. The scope of human observation is limited and requires solid support, good theoretical assumptions, and the ability to logically formulate the results of the observations obtained. Therefore, while inductive and deductive theories may appear different at first glance, they are actually interconnected. When discussing theory, start with facts, and when discussing facts, start with theory. To achieve perfect scientific knowledge, reasoning from both methods must be used simultaneously in research and should complement each other in the context of scientific research that adheres to logical thinking laws (Hawton, 2003).

CONCLUSION

The analysis of inductivist theory in proving truth or forming knowledge through scientific reasoning has received much criticism and argument. Therefore, this should be viewed through a lens that provides guidelines to address or find solutions to problems, so as to overcome the weaknesses of inductivist theory. Advanced technology is required to fully utilize the limited senses and improve the accuracy of observations. Additionally, the experimental methods used must be carefully determined to minimize bias due to the limitations of human observation. Furthermore, the experience used as the foundation for truth should be based on relevant theories, as relying solely on personal experience can lead to a high level of subjectivity. Thus, it is crucial to review prior knowledge to ensure that the nature of truth in the searches conducted thus far holds a relatively higher degree of objectivity. Knowledge does not only stem from mere search or experience; it must also be explainable from the experiences that have been undergone.

Criticism of induction can also be seen as a critique of science itself. The limitations of induction as a scientific method remind us that scientific truth is not the only form of truth that exists. As scientists, we must humbly acknowledge that there are other truths outside of science that deserve respect. Therefore, in the pursuit of harmony and balance in life, scientific truth cannot stand alone. It must be integrated with truths from other fields such as art, ethics, and religion. Scientists must also be open to understanding non-scientific knowledge, which will provide a richer and more dynamic dimension to the development of scientific knowledge. Moreover, scientific truth is characterized by being probable, tentative, evolutionary, and relative, and it will never achieve perfection, because science is always a human endeavor that continuously evolves through critical thinking and reflection.

REFERENCES

- A. Sonny, K. (2001). *Ilmu Pengetahuan: Sebuah Tinjauan Filosofis*. Kanisius.
- Achmad Charis Zubari, A. B. &. (1990). *Metodologi Penelitian Filsafat*. Kanisius.
- Bagus, L. (1996). *Kamus Filsafat*. Gramedia Pustaka Utama.
- Bakhtiar, Amsal. *Filsafat Ilmu, Edisi Revisi*, Jakarta: Raja Grafindo Persada, 2012
- Dosen Filsafat Ilmu UGM, T. (2003). *Filsafat Ilmu: Sebagai Dasar Pengembangan Ilmu Pengetahuan* (3 ed.). Liberti.
- Fautanu, Idzam. *Filsafat Ilmu: Teori dan Aplikasi*, Jakarta: Referensi, 2012
- Haryono Imam, C. V. &. (1991). *Filsafat Ilmu Pengetahuan*. Gramedia Pustaka.
- Hawton, H. (2003). *Filsafat yang Menghibur: Penjelajahan Memasuki Ide-ide*, terj. Supriyanto Abdullah. Ikon Teralitera.
- Hendrik Rapar, J. (1996). *Pengantar Filsafat*. Kanisius.
- Hilmy, M. (2013). Induktivisme Sebagai Basis Pengembangan Ilmu Pengetahuan Dalam Islam. *Jurnal Studi Keislaman Ulumuna*, 17(1), 107.
- Kattsoff, Louis O. *Pengantar Filsafat*, terj. Soejono Soemargono, Yogyakarta: Tiara Wacana, 2004.

- Maksum, M.Ag., M.Si, Dr. A. (2016). *Pengantar Filsafat: Dari Masa Klasik Hingga Postmodernisme*. Ar-Ruzz Media CV.
- Muhammad Iqbal, S. (2013). *The Reconstruction of Religious Thought in Islam*. Stanford University Press.
- Setianingsih, Y. (2020). Induktivisme-Empirisisme Francis Bacon dan Relevansinya Bagi Ilmu-Ilmu Keagamaan. *Indonesian Journal of Islamic Theology and Philosophy*, 1(2), 63-84. <https://doi.org/10.24042/ijitp.v1i2.4930>
- Suriasumantri, Jujun S. *Filsafat Ilmu: Sebuah Pengantar Populer*, (Jakarta: Pustaka Sinar Harapan, 2000, cet. ke 13
- Susanto, A. (2011). *Filsafat Ilmu: Suatu Kajian dalam Dimensi Ontologis, Epistemologis dan Aksiologis*. Bumi Aksara.
- Wahana, P. (2016). *Filsafat Ilmu Pengetahuan*. Pustaka Diamond.
- Yusuf Lubis, Akhyar. *Filsafat Ilmu: Klasik Hingga Kontemporer*. Jakarta: Rajawali Pers, 2014
- Velasquez, Manuael. *Philosophy; A Text With Readings*, America: Wadsworth Publishing Company, 1999.
- Zubaedi, dkk. *Filsafat Barat; Dari Logika Baru Rene Descartes Hingga Revolusi Sains ala Thomas Kuhn*, Yogyakarta: ar-Ruzz Media, 2007