

CRITICAL STUDY OF THE MODERN SCIENCE EPISTEMOLOGY

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ABSTRACT

Epistemology is a branch of philosophy which deals with the nature, scope of knowledge, basis, and its presuppositions. Modern science raises problems both the spiritual crisis and the ecological crisis. Both of these are due to the rationale that separates God from science. So that faith becomes weak and doesn't even exist at all. This paper will elaborate further on the epistemology of modern science, starting from the theory of knowledge in the form of sources and ways of obtaining knowledge, scientific methods, to measures of truth. This study is very important to be reexamined so that it strengthens the philosophical foundation related to science, then emerges various critical competencies in interpreting modern science. This library research is sourced from various references in the form of books, national and international scientific journal articles. The data collection technique is to conduct a review of the books and journal articles. The data obtained were processed by content analysis. The results of the research reveal that the epistemology of modern science originates from reason and experience, resulting in various theories of truth ranging from rationalism, empiricism, positivism, phenomenism, dialectics, criticism, and intuitionism. To produce scientific truth, we need a method that is also scientific, such as logico-hypothetico-verifikatif, or Deducto-Hypothetico-Verification. As a measure of truth, it can be done by verification and falsification.

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INTRODUCTION

Epistemology is a branch of philosophical studies that examines specifically matters related to the source of scientific truth, methods of finding these truths, and measures of truth. In line with what Barlia expressed that epistemology is part of a philosophy that emphasizes the search for the source of truth of knowledge.ⁱ Meanwhile, according to Chalik, epistemology is an explanation of science or the study of science. But in general, he agrees with the understanding that epistemology is a branch of philosophy which deals with the nature, scope of knowledge, its basis, and its presuppositions. Epistemology is limited to the study of philosophy that investigates the origin, structure, method and validity of knowledge.ⁱⁱ

Science or science is not only knowledge or is called knowledge, but summarizes a variety of knowledge based on agreed-upon theories and can be systematically tested by a set of methods that are recognized in certain fields of science. Science is built on the desire of humans who always try to think more deeply about the knowledge they have.

The presence of modern science with the understanding of its thoughts raises various criticisms to become a problematic conversation in the world. Among the philosophers who have criticized modern science is Sayyed Hossein Nasr. Nasr argues that modern science has created a spiritual crisis because it separates science and religion. This has resulted in decadence, desacralization, and a human focus solely on materiality. For this reason, Nasr offers sacred science which is the embodiment of perennial philosophy as an effort to solve the problems of modern science.ⁱⁱⁱ This is done to ward off attacks on the foundations of belief in religion. The view of God is separate from science and scientific explanation, and God only occupies a hypothetical position, so that a scientist feels that he does not need the hypothesis anymore.^{iv} Modern humans are humans who are separate from other humans (individualism), and separate from God (egocentrism).^v

Modern Western Science scientists are in chaos or "chaos", they, namely the western people began to realize that they have eliminated religion in their lives and turned to science which is full of "certainty" it. But now it turns out that science is also afflicted by the principle of uncertainty. As a result of incorrect human observation abilities.^{vi}

In addition to spiritual crises, modern science also raises ecological crises as an inevitable impact of the western world view (world view) and partial and reductionist modern civilizations on nature, such as the existence of a culture of materialism, utilitarianism, anthropocentrism and capitalism.^{vii} The modern epistemology that was born by Bacon, known as (knowledge is power), which believes that the goal of science is not only to understand the universe, but also to control it. In other words, conquering nature and exploiting it cannot be considered a mistake.^{viii}

Studies related to modern science show us that modern science raises problems because of the rationale that separates God from science. So that faith becomes weak and doesn't even exist at all. This paper will elaborate further on the epistemology of modern science, starting from the theory of knowledge in the form of sources and ways of obtaining knowledge, scientific methods, to measures of truth itself such as verification and falsification. This study is very important to be reviewed and reviewed so that it strengthens the philosophical foundation related to science for readers, and then various critical competencies emerge in interpreting modern science.

The method used in producing the writings that the author describes, uses the library research method , with data sources from various references from books, National and International scientific journal articles related to the epistemology of modern science. The data collection technique is to conduct a review of the books and journal articles. The data obtained were then processed by content analysis.

EPISTEMOLOGY OF SCIENCE

Epistemology comes from Greek, namely *episteme* and *logos*. *Episteme* means knowledge, science, and *logos* means science, information. Usually epistemology is defined as a theory of knowledge, or knowledge of knowledge. But in general, epistemology can be understood as part of a philosophy that examines the origin, nature, method, and limitations of human knowledge. The purpose of all stages of scientific epistemological activity is so that humans are able to obtain correct knowledge.^{ix} It is in line with what Rai Utama said that epistemology is how to get correct knowledge.^x

The discussion in epistemology has developed, namely the discussion focuses on sources of knowledge, processes and methods for obtaining knowledge, ways to prove the truth of knowledge, and levels of truth of knowledge.

In epistemology, it is studied about the nature and limits of the power of the mind, to what extent the ability and power of the mind can penetrate the fundamental structure of reality, and how precisely the ideas or concepts that have been successfully formulated by the mind in describing and explaining the essence and fundamental structure of a reality.^{xi}

If the epistemological problem is related to the object of philosophy, it will be closely related to what is thought. If what science thinks about, it means that the object is the philosophy of science. If what you think about is ethics, it means that the object is ethical philosophy and so on. It can be understood the breadth of the object of philosophy, as broad as the human desire to find the truth. If the epistemological problem is related to how to obtain knowledge which is called scientific science, then it requires a scientific method, namely procedures in observation and experiments in investigating nature that scientists use to process facts, data and their interpretation in accordance with certain principles and rules. If the epistemological issue is related to the theory of truth, what is truth, what are the criteria, how to obtain correct knowledge, it will lead to discussions related to the theory of truth in philosophy, such as rationalism, empiricism, positivism, and so on.

ACQUISITION OF SCIENCE KNOWLEDGE SCIENTIFIC

Knowledge as it exists today, did not just come to humans. There are stages that tell how the human process is in obtaining this scientific knowledge. Step by step, in order to get better things, so that they can be agreed upon, implemented, and passed on to today's scientists. In this section, we will not only talk about how to obtain scientific knowledge, but will also discuss the sources of scientific knowledge. The explanation related to this is as follows:

First, Rationalism

The emergence of rationalism is driven by humanism, which is an understanding in philosophy that teaches about the human ability to organize himself and the universe.^{xii} Humanism has emerged since Ancient Greece because humans have long needed rules that can make humans live in an orderly manner. In addition to the rules needed to govern himself as a human being, rules are also needed to govern nature. If there are rules that can be used to regulate nature, then humans can take advantage of nature, or in other words, nature can make human life easier.

The rule maker who can do all of this is what the Ancient Greeks believed was man himself. Then the problem arises, how to make these rules. Because at that time what developed together with scientific knowledge was mystical knowledge. If rules are to be formulated based on myth or religion, it is not easy to produce agreed upon rules, among the causes is that myths are not sufficient to be used as a source in making rules to regulate humans and nature. As for religion, it will get rejection from many people, because religion is not one, and each religion believes that its religion is true and the other is wrong. Even though the main basis for making a rule is everyone's agreement.

The turmoil in determining the source in making these rules culminates in the source that is in humans themselves. The source in question is the reason given by God as a tool for humans to think and distinguish between right and wrong. Intellect is deemed capable and works for everyone based on the same rules. Then rationalism was born.

Rationalism is an understanding that believes that reason is a tool in seeking and measuring knowledge.^{xiii} Knowledge is sought using reason is by way of logical thinking, then tested whether what is found is logical or not also using reason. Intellect is the measure of right and wrong. If it is logical, then the finding is true, and vice versa if it is not logical, then the finding will be wrong.

The figure who pioneered this understanding was Rene Descarter, then attributed to several western figures such as Spinoza, Christian Wolf, and Leibniz. However, the roots of this thought have been found in the thought of classical philosophers such as Plato and Aristotle.^{xiv}

This understanding emphasizes the role of reason which is very important for humans. Intellect or the innate idea is also the source of truth. These innate ideas are divided into three groups, namely *First: Cogitans* or thoughts, that by nature humans carry the innate idea that they are aware that they are thinking creatures, from here comes Descartes' very famous statement, namely *cogito ergo sum*, namely I think so I exist. . *Second*, Allah or *deus*, humans naturally have the idea of a perfect form, and that perfect form is none other than God. *Third, Extensia* or breadth, namely the innate idea of man, matter which has a breadth in space.^{xv}

The three innate ideas above are used as axioms of knowledge in the philosophy of rationalism that are unquestionably true. In the method of attaining knowledge, Descartes introduced a method known as the method of doubt, which is to doubt everything, including everything that has been assumed to be certain in the framework of human knowledge.^{xvi}

However, as the development of thought often what the mind encounters becomes contradictory. An occurrence with objects in two different circumstances can be equally logical if judged by many people. Even on the contrary. As happened in Ancient Greece, it can be proven that an object in motion is the same as being at rest. This incident can be proven so that it is both logical. When the arrow is released from the bow, two events occur, namely moving and remaining still. It is said to be moving because it has moved from the bow to the target. Meanwhile, it is said to be silent because one day the arrow is in place. The belief at that time that an object is said to be moving

when it has moved, and is said to be stationary if it is in one place. These two logics when linked to the arrows become both logical. Finally, the presence of rationalism also does not guarantee the obtaining of truths that can be agreed by many people. Then was born empiricism.

Second, Empiricism

Empiricism is an understanding that states that truth is logical and can be proven empirically. Empiricism itself comes from the Greek language, namely *empeirikos* which means experience. According to this school, humans acquire knowledge through experience.^{xvii} empiricism was first introduced by John Locke with the opinion that the only way humans acquire knowledge is through experience. Locke firmly argues that humans are unable to formulate or have inherent ideas.^{xviii}

In the case of the arrow that causes disagreement about the logic, according to true empiricism it is moving, because it can be proven empirically. If a balloon blocks the arrow, the balloon will be pierced by the arrow. This shows that the arrow was moving because it was able to penetrate an object. If you stay still, you will not be able to penetrate the balloon.

Furthermore, the rules for regulating man and nature were made with empiricism. In line with its development, it is also inseparable from its shortcomings. Empiricism can only be applied in concepts that are still general and not yet operational, so they are not measurable. The words empiricism are like hot tea, the flame is hotter, the boiling iron is very hot, or these marbles are small, the moon is bigger, the earth is bigger, and the sun is very big. For that in turn gave birth to positivism.

Third, Positivism

Positivism is an understanding that believes that truth is something that is logical, empirically proven, and measurable.^{xix} A well-known figure as the originator of this positivism is Auguste Comte, who embraced both philosophical and political movements. This belief in positivism is

that the senses are very important in the acquisition of knowledge, but must be sharpened through tools and strengthened by experiments. It can be stated, if the positivism paradigm then the object must be empirical as the knowledge shows science and can be measured with logical and empirical evidence.^{xx}

Positive implementations come in many forms depending on the science to which they are applied, for example, in astronomy, the positive method is regarded as an observation, in physics as an experiment, and in biology as a comparison. The term positivism is used to express a scientific approach to the world. In addition, another characteristic of positivism is the elimination of metaphysics from philosophy.^{xxi}

As a continuation of the previous case, it is known that the heat contained in this object can be measured, namely, coffee water has a heat of 80⁰C, educating water has a heat of 100⁰C, boiling iron is 1000⁰C, and this is 1 meter, all of these measurements are operational.^{xxii}

Positivism was agreed upon in starting to make rules that govern humans and nature. But in this positivism, which demands that truth be logical, there is empirical, measurable evidence. Then a new question arises, how do you do it? Here we still need another tool, namely the scientific method.

Fourth, Scientific

Method The scientific method is a procedure that includes various patterns of thought and work patterns, procedures, approaches, technical methods and various tools used to acquire knowledge or develop knowledge.^{xxiii}

There is nothing new in the scientific method compared to what already exists with positivism, only to reaffirm positivism in a more operational manner. Through the scientific method, it is known that the steps in obtaining correct knowledge are the *logico-hypothetico-verifikatif step*,

where a person must be able to prove the truth logically, then propose a hypothesis based on that logic, then prove the hypothesis empirically.

With this scientific method, technical and detailed rules are formulated in the field of Research Methods. The research method produces various research models that are more operational in making rules in regulating humans and nature.

Deducto-Hypothetico-Verifikatif is a scientific method that combines deductive and inductive methods. Through the deductive method, a logical frame of mind is obtained, and through the inductive method, a proving or testing framework is obtained in finding the certainty of a truth. The implementation of this method takes steps, namely the formulation of the problem and the preparation of a framework for proposing hypotheses.

The formulation of a research problem must be based on research problems that are supported by existing facts. Meanwhile, the preparation of a framework for testing hypotheses through the preparation of literature reviews from various sources such as books, magazines, newspapers, scientific articles, theses, dissertations and so on. Hypothesis formulation or hypothesis submission is formulated in accordance with the framework that has been built.

The epistemological basis of science is called the scientific method, which is the way in which science arranges correct knowledge. The scientific method is a procedure for gaining knowledge which is called science. So, science is knowledge obtained through the scientific method. Not all knowledge is called scientific, because science is knowledge in which the method of obtaining it must meet certain conditions. The conditions that must be met in order for a knowledge to be called science are listed in the scientific method. The scientific method plays a role in the level of transformation from the form of knowledge to knowledge. Whether or not knowledge can become science depends very much on the scientific method. Thus the scientific method is always supported by two pillars of knowledge, namely the ratio and facts integratively.

Fifth, Phenomenalism

The figure who introduced phenomenology was JH, Lambert to show the theory of appearance. Phenomenology was introduced as the theory of truth, logic and semiotics. It can be said that phenomenology is a science related to phenomena or anything that appears. The essence of phenomenology is to grasp the essence of phenomena. In the work process, a method is needed to eliminate things that are not essential so that each phenomenon can reveal itself. The philosopher who used the term phenomenology in an established sense was named Husserl. Phenomenology is understood as descriptive analysis and introspection regarding the depth of all forms of direct awareness and experience.^{xxiv} Starting with empirical observations, Husserl strives to reach conclusions framed within the sphere of science. This is one of phenomenology's most transcendental contributions to science.^{xxv}

Sixth, Dialectical

The figure in the dialectical school is George Willhelm Friedrich Hegel. Hegel's philosophy emphasizes the subjectivity part of the idealism school. Hegel's famous saying is that which is real as is thought, so thought is reality. All facts are the appearance of an infinite mind. The path to understanding reality by following the movement of thoughts or concepts. Dialectics is expressed by the step of proposing an understanding, offering its opponent, then reconciling by finding the strongest part of the two. Fichte refers to thesis, antithesis, and synthesis.^{xxvi}

Seventh, Criticism

In the philosophy of criticism, Immanuel Kant considers that both human experience and reason can be used in achieving human knowledge. Furthermore, Kant divided the stages of attaining human knowledge into several levels, namely;

First, the stage of sensory attainment, namely the first stage in the process of attaining knowledge for Kant is the attainment of the senses towards external reality. However, what humans can achieve is only the phenomenon or visible symptoms which are nothing but the synthesis of elements that come from outside as matter within *a priori* space and time in the structure of human thought.

Second, the stage of reason, that is, along with the spontaneous attainment of the senses the human mind operates. The task of the human mind is to compile and relate sensory data. In this case the human mind works with the help of its fantasy power. Knowledge of reason can only be obtained when there is a synthesis between sensory experiences and the forms *a priori* named by Kant with categories, namely innate ideas that have an epistemological function in humans to organize knowledge.

Third, the ratio / intellect stage, namely the basic ability that creates general and absolute meanings. At this stage, the process of human knowledge has arrived at fundamental principles that can no longer be coherent and absolute. Kant called it a transcendental idea. The task of this transcendental idea is to draw conclusions from statements at a lower level.^{xxvii}

Eighth, Intuitionism

Intuitionism is the result of the epistemology of Western philosophy pioneered by Henry Bergson. According to Bergson, intuition is the result of the evolution of the highest understanding. Furthermore, Bergson stated that human senses and reason are both limited in understanding reality as a whole. According to him, intuition is direct knowledge, which is absolute and not relative knowledge. Intuition transcends the outward nature of symbolic knowledge, which is essentially analytical, comprehensive, absolute, without the aid of symbolic imagery. Therefore intuition is a means to know directly and immediately.^{xxviii}

MEASUREMENT OF THE TRUTH OF SCIENCE KNOWLEDGE SCIENCE

Knowledge that has been generated through sources and methods will then be tested to find out the truth of scientific knowledge. If scientific knowledge is able to be proven true, then it deserves to be called a science according to the principle of verification. On the other hand, what is understood in the principle of falsification, namely that scientific knowledge can be denied and condemned deserves to be called science. For further explanation as follows:

First, Verification

Verification in the Big Indonesian Dictionary is checking the correctness of reports, statements, money calculations, and so on.^{xxix} The verification approach states that something new is worthy of being called a science if its statements can be verified, that is, it can be proven by the five senses.

This verification principle states that a theory is meaningful if it can be tested by experience and can be verified by observation. Verification is a logical philosophical theory which says that the source of knowledge comes from experience which is then tested by a verification method that is empirically proven. If the statement can be verified then the statement is meaningful (scientific), and if the statement cannot be verified then the statement is meaningless (non-scientific) such as aesthetics, ethics, religion, metaphysics.

A well-known figure in this principle of verification is the philosopher of the Viennese Lingkaran group, Rudolf Carnap. According to Carnap, science is a system of statements based on direct experience, and controlled by experimental verification. Verification in science is not a single statement, but includes the systems and subsystems of the statement.

Carnap divides verification into direct verification and indirect verification. Direct verification is that if a statement shows a present perception, such as: I now see a red field with a blue base, then

this statement can be directly tested against our current perception. the statement can be verified directly by sight. It means that if he doesn't see it, then he is denied. Meanwhile, indirect verification is through deduction from perceptual statements. A statement that contains theoretical meaning, it is impossible to verify by presenting an *image of* something, but with the possibility of deduction from the perceptual statement, because of the possibility of verification. We do not have an actual picture of the electromagnetic field from the graphical plane, but the perceptual statements can be detected from these statements.

The verification approach requires empirical evidence for the hypothesis before it becomes a theory. In proving it, the verification approach uses an inductive method where the facts are first collected, then generalized. This approach is commonly used in the natural sciences. If some of the material A does not have the character of B, A must not be B. Generalization does not examine all of A and deduce the properties of A, but only takes a sample.

Data verification is intended to collect, manage, and analyze data to test hypotheses. If the hypothesis has been tested through empirical facts, the answer reaches a definitive level, and the scientific truth can be justified when it has gone through the correct procedure.

This principle of verification has drawn criticism from Popper's philosopher by bringing up several weaknesses in this principle, namely:^{xxx}

First, the principle of verification can never be used to state the truth of general laws. General laws in science can never be verified. Because, like metaphysics, it must be admitted that all natural science (which consists largely of general laws) is meaningless. *Second*, based on the principle of verification, metaphysics is said to be meaningless, but in history it can be seen that science has often emerged from metaphysical or even mystical views of the world. A metaphysical expression can not only be meaningful but also true, even though it will only become scientific if it has been tested and tested. *Third*, to investigate the meaning or not of an expression or theory, it must first

be understood. So, the problem is, how can it be understood if it is meaningless, then what is a theory?

On this basis, Popper put forward the principle of falsification as the main feature of Scientific theory. Proper stated that an empirical theory must be seen as potential errors. A theory is scientific, if it is possible in principle to declare it wrong. A theory which in principle excludes every possibility to put forward a fact that defines the theory as wrong, according to Popper is definitely not scientific.

Second, Falsification

According to the Big Indonesian Dictionary, the word falsification means error.^{xxxi} Falsification is an understanding that believes that every theory put forward by humans, not all of them will be in accordance with the results of observations and experiments or mistakes may occur. So, theory contains uncertain and changeable properties, because the belief in this principle is that no science of human products is 100% the same as the results of observations from existing reality. A science never reaches the level of truth in this principle of falsification. Scientific activity is only able to approach the truth or resemble the truth. The theory is just a hypothesis that has not been proven wrong. The theory that survives falsification will be tentatively accepted as true.

If verification is used to find the truth of a theory, then falsification is used to find fault with a theory. A theory must be falsifiable, that is, the opportunity to be blamed inductively-empirically or deductively-rationally. The greater the probability or chance to be refuted, the better and stronger the validity of the theory. This is because the theory that is refuted will continue to improve itself and the stronger the building will be. The hypothesis that is used before the theory can be proven is also searched for. If there is an error in the hypothesis, then the hypothesis and the theory that will be built will be invalidated.

The famous figure in this falsification is Karl Popper. He was born in 1902 in Vienna. Popper described himself as a very sharp critic of the Vienna Circle group, especially on matters of verification. Popper argues that falsification or falsifiability is the right limit (demarkation) between science and non-science.^{xxxii}

According to Popper, one of the characteristics of science is that it must be able to be proven wrong through a process of falsification. Because then science will experience a process of reduction in errors (*error elimination*). The falsification process will bring a science closer to the truth, but still have a falsifiable character.^{xxxiii} Popper asserts in this falsification principle that the truth of a science is not seen from the justification (verification), but through the attempt to deny the propositions built by the science itself.^{xxxiv}

To measure the scientificity of a theory, Popper's falsification principle is carried out in several stages, namely, *responsibility* (to be blamed), *refutability* (able to be refuted), and *testability* (tested). Just as if students have a tendency to be curious about a science, the teacher must be able to make these students play a direct role in getting facts with this stage of falsification.^{xxxv} This principle of falsification was later used as a demarcation boundary and replaced verification.

Then, metaphysics and religious sciences in which there are theories that can be refuted and undergo development, therefore metaphysics and religious sciences can also be categorized as scientific, according to Karl Popper's principle of falsification.^{xxxvi}

As for the work system of science with the falsification principle put forward by Popper, namely, *First*, an empirical / scientific knowledge is declared true, if the system can be tested (falsifiability) and not variability. For example, Tomorrow will rain, because empirically it can be denied. Popper proposed that falsifiability as a demarcation criterion is based on an asymmetry between verifiability and falsifiability, because universal statements cannot come from a single statement, on the contrary can be contradicted by singular statements.

Second, methodologically, falsification must doubt a knowledge that there may be errors in observing. For example, it is not a swan that is being observed, but a bird. So for systematic refutation (denial), the theory must be clearly formulated so that it opens the possibility for denials that might be proposed. On the other hand, a theory is not abandoned easily, because it identifies an uncritical attitude towards testing, and thus the theory itself is not tested as hard as it should be.

Third, a hypothesis or system of hypotheses wants to be recognized as having a status as a scientific law or theory. If it is going to be part of science, then a hypothesis must be falsifiable, before going any further. Example: all substances expand when heated. The statement is falsifiable, it will be wrong if there is observational information showing the fact that a substance x does not expand when heated. So a hypothesis is falsifiable if there is an observational explanation or a set of observational information that is inconsistent with it, that is, if it is declared to be true, then it will falsify the contents of the hypothesis.

Fourth, the theory must be stated clearly and accurately and clearly. If a theory is proposed in such a vague way that it is not clear what exactly is desired, then when tested by other observations or experiments, it can be interpreted in such a way that it is always consistent with the test results. In this way, he can be defended in the face of falsification. A similar situation has a relationship with rigor, the more thoroughly a theory is formulated, the more it becomes falsifiable. If we accept that the more falsifiable a theory is, the better. For example, the planets moving in an ellipse around the sun is more precise than the formula for "planets moving in circles in circles around the sun".

Fifth, the guesswork of bold speculation. The secrets of science will advance with the help of creativity and fundamentals. The greater the number of predictive theories confronted with reality, the greater the number of opportunities for important advances in science.

In addition to the prerequisites for the Popper's Falsification criteria, Popper also initiated a practical method to solve the problem, including: First, the theory of *variance trial and error*, which is an experimental method and error removal. This method, Popper said, is used in the

development of the human mind and especially in the development of philosophy, can be described as a special variant. The way the theory works is proposed tentatively and tried out. If the results of a test show that the theory is wrong then the theory is discarded. The experimental and error removal methods are essentially elimination methods. Success depends primarily on three conditions: namely that the various theories proposed are varied and that they are taken seriously.^{xxxvii} Popper claims that nature will eventually reveal its secrets as long as certain research methods are applied in an impartial and correct manner.^{xxxviii}

CONCLUSION

It can be concluded that the epistemology of modern science originates from reason and experience, resulting in various theories of truth ranging from rationalism, empiricism, positivism, phenomenalism, dialectics, criticism, and intuitionism. To produce scientific truth, a method that is also scientific is needed, such as *logico-hypothetico-verifikatif*, where a person must be able to prove the truth logically, then propose a hypothesis based on that logic, then prove the hypothesis empirically, or *Deducto-Hypothetico-Verification* is a scientific method. which combines deductive and inductive methods. Through the deductive method, a logical frame of mind is obtained, and through the inductive method, a proving or testing framework is obtained in finding the certainty of a truth. The implementation of this method takes steps, namely the formulation of the problem and the preparation of a framework for testing hypotheses. As a measure of truth, it can be done by verification and falsification. If scientific knowledge is able to be proven true, then it deserves to be called a science according to the principle of verification. On the other hand, what is understood in the principle of falsification, namely that scientific knowledge can be denied and condemned deserves to be called science. The results of this study will open up space for the next reviewer or researcher to look further into the epistemology of modern science from various perspectives and multidisciplinary so as to contribute various theories regarding this. In addition, critical studies will also strengthen understanding and depth of knowledge related to the theme.

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