A REVIEW: USE OF DOGMATIC AND PRAGMATIC APPROCHES IN PHYSICS FOR INVESTIGATING A SYSTEM

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ABSTRACT

Science is a study of nature. For this purpose, two approaches are used to investigate a physical system i.e. the dogmatic & the pragmatic approach. Both have different ways of investigation. Dogmatic approach is related to realism but pragmatic approach is related to idealism. Generally, physicists use both approaches separately for solving a system. The following paper has keenly attempted to express the relation between these approaches on behalf of examples from physics. Both can be used individually, but it is better for studying a system proficiently both are used collectively.

*Keyword***:** **Idealism, Realism, Meta-Physics, Criticism, Investigation**

1. **Introduction**

Investigation is the biggest source of data and information about a system. Generally, it is said that science (having any type i.e. physical or chemical etc.) is the study or investigation of nature by using some tools and approaches. Those govern us about the reasons and the properties of the incidents that happened in nature. Investigation approaches are quite different from others depending on the thinking of the researcher. According to my observation physicists use two types of approaches. In the past, these approaches dogmatic approach & pragmatic approach have led physicists to their great discoveries. Both approaches follow different ways of solving a system.

In philosophy of science, the pragmatic approach is said to the word criticism & realism [1][2]. The pragmatic approach is directly related to reality. It is based on practical and experiment experiences. Those physicists who are in favor to use a practical approach, basically they have the aim to get one thing new by using the already developed laws. They investigate by using the experimental sources. Their main purpose is just to inaugurate reality. When they are tackling a problem, they give fully attention to all pervious facts that are connected with their problem. If their observation taken by using chosen apparatus is not meet is with initial conception, they feel no hesitation to reject it. Reality is always their final goal [3].

Similarly, the dogmatic approach is based on one's ideas or opinions or might be based on arbitrary definitions. It is related to the word idealism [4] in term of philosophy of science (Mate-Physics). Those physicists, who are in the favor of a dogmatic approach, deal a problem completely different manner. They use some idea that arise in their minds or some arbitrary (discretionary) definitions that have some symbolical relationship with science. They use the combination of logic and mathematical operator to derive some results that are associated with the mathematical expression.

The goal of a pragmatic physics is reality and an appropriate way to his goal as well as careful observation [5]. But the goal of dogmatic physics is a dogmatic formulation and his way based on logical as well as mathematical construction. A pragmatic physical research is a way of evolution of result find out from experimental work. For pragmatic physicist there is no modern physics or classical physics, but only physics. A dogmatic physical research is a process of consistent formalistic movement towards upset contrary to existing standards and towards the achievement of general acknowledgement [3].

Let we see point of views of philosophers about dogmatism and pragmatism. Popper is one of them who are in the favor of use of dogmatism in science. In 1970, Popper published [6]:

"I believe that science is essentially critical... But I have always stressed the need for some dogmatism: the dogmatic scientist has an important role to play. If we give in to criticism too easily, we shall never find out where the real power of our theories lies." (Popper, as cited in Kuhn vs. Popper on criticism and dogmatism in science: a resolution at the group level, 2011, p. 5)

As the above passage is showing that although science is critical and experimental but there is also some need for dogmatism in solving a problem. According to Popper's views a problem cannot be solved properly without some use of a dogmatic approach. Similarly, philosophers Hume [7] & Kant are also in favor of the dogmatism [8]. According to Kant dogmatism is very important for pure knowledge science. Moreover, Metaphysics can keep on dogmatically once we examine how we overcome our concepts (philosophical).

 Kant has expressed his point of views about dogmatism in such a way:

"This critique is not opposed to the dogmatic procedure of reason in its pure knowledge, like science, for that must always be dogmatic…………. Dogmatism is thus the dogmatic procedure of reason, without previous criticism of its powers………….. On the contrary, such criticism is the necessary preparation for a thoroughly grounded metaphysics, which, as science, must necessarily be developed dogmatically……………..the Schools." (Kant, as cited in Non-Kantradiction, 2011)

On the other hand philosophers like John Dewey [[9] & Thomas Kuhn are in favor of pragmatism in science. Thomas Kuhn has suggested normal science in philosophy. He showed normal science as puzzle solving. In 1996 he explained his view as following:

 "Trial attempts [to solve puzzles], whether by the chess player or by the scientist, are trials only of themselves, not of the rules of the game. They are possible only so long as the paradigm itself is taken for granted." (Kuhn, 1996, as cited in Kuhn vs. Popper on criticism and dogmatism in science: a resolution at the group level, 2011, p. 6) [6]

This is a slight view on thinking of some philosophers about said approaches. In this work, we want to express the relationship between these two approaches by using several examples from physics.

1. **Relation Between Dogmatism & Pragmatism**

As concerning mention inside the reference [6], Popper has discerned that pragmatism, as well as dogmatism, is important for solving the problem in science. While dealing with a problem by using only pragmatic approach or only dogmatic approach, we might have to face some complications. However, if we are dealing with a problem with pragmatic as well as the dogmatic approach we might face less complication; as result of one approach might offer the way for the implementation of other

If we talk about physics, same thing can be implemented in this field of science. Physics is fully packed with different examples in which not only the dogmatic approach but also the pragmatic approach has used. For example, the 2nd law of motion (is associated example of pragmatic approach) that’s stated: The force applied on an object produces the acceleration as the mass of the object is kept constant i.e. F =ma. This law is through an experiment proven. However there's still a need for boundary conditions at beginning while using this law to solve a system. Also we tend to neglect some factors i.e. fractional, gravitational, and other factors. We use it solely ideally to avoid the complication. Otherwise, we would not able to solve the problems of motion properly or avoid the complication by exploitation this law. This thing is expressing that there is some use of dogmatic approach in the form of boundary conditions. The work on the laws of gravity by Isaac Newton [10] was also including some use of dogmatic approach due to "Apple Incident\*1". On the other hand the use of these laws during solving a system of physics is expressed in the pragmatic approach. The Special theory and the General theory of Relativity [11] are depending upon the mathematical relation of some arbitrary definitions and space-time coordinates. One's can easily judge that this is a dogmatic approach to solve the relativistic problem. Moreover, the prediction of a massive object in space by the General Theory of Relativity was also the dogmatic approach to solve the mystery of the existence of black holes. Under that prediction, now we are able to study the properties of these massive objects by different experiments. Means, whether these theories are dogmatic approach but these are providing a path to use a pragmatic approach for the discovery of new knowledge. Similarly, in cosmology there is also presence of dogmatic approach as well as pragmatism approach [12]. Quantum Mechanic [13] largely depends on the dogmatic approach to solving problems i.e. Schrodinger wave theory and Heisenberg's Uncertainty Principle etc. because; it is an indeterministic theory as compared to the Classical Mechanic. One cannot get a definite answer to the problem i.e. position or momentum of an electron; only a probabilistic answer is possible that expressed a dogmatic act. But we can also see a pragmatic approach in Quantum Mechanic i.e. photoelectric effect & Diffraction Pattern. These are some examples in which both approaches are applied to get a convenient result from a particular system. Other branches i.e. Chemistry & Biology have also used these approaches while interacting with problems.

$\*\_{1}$ *Though Newton’s inspiration for his theories on gravity are often attributed to the “Apple Incident” – i.e. where he watched an apple fall from a tree – the story is considered apocryphal by modern sources who argue that he came to his conclusions over time. However, Newton himself described the incident, and contemporaries of his defend this assertion.*

1. **Result & Discussion**

We have discussed about the dogmatic and pragmatic approaches under views of different philosopher of science. We come to know that physicists those use dogmatic approach for solving a physical system deal quite in different manner form those who are using pragmatic approach. The dogmatic approach deals to idealism and the pragmatic approach deals to realism. Whether the ways of solving the problem are different from these approaches, but they both have the same destinations.

The attempt of this paper is to express the relation of dogmatic and pragmatic approach in physics. For this purpose, we have picked some examples from physics. Like, we have to use some dogmatic approach (in the form of boundary condition) with pragmatic for implementation of 2nd law of motion. Moverover, Einstein study of a massive object in space by use of his General Theory of Relativity was whether a dogmatic approach however his main goal was to understand the black holes and other space's objects as other scientist are studying by using the experimental approach.

As a result we can say these approaches have deep relation with one another. Sometime dogmatic approach provides a path to apply pragmatic approach to understanding or solving a system & sometime pragmatic approach provides a path for dogmatic approach. Whether, one can either apply dogmatic approach or pragmatic approach to solving a system. But he might face some complication or might not able to get desired result. So, partially a problem can be solved conveniently by use of the pragmatic approach & dogmatic approach.

# Conclusion

We can conclude that two types of approaches are used by physicists and others for solving a system. The pragmatic approach can be described in term of realism and the dogmatic approach in term of idealism. However which of them is better this is depend on the thinking of the researcher or physicists because a pragmatic physicists use experiments to understand a problem and a dogmatic physicists use quite different ways to solve a problem. Many Philosophers like Popper, Hume & Kant etc. are within the favor that some dogmatic approach should be used in science for investigation. There are also those like Kuhn & Dewey who are in the favor to use pragmatic approach in science. But for solving a problem conveniently we have to use both approaches combine.

# Reference

1. Retrieved from *“*<http://www.differencebetween.net/miscellaneous/difference-between-idealism-and-realism/>”,Dated: 09-02-2020.
2. Chalmers, A. F. 1998. “What is this thing called Science?”(3rd ed.), *Hackett Publishing Company, Inc. Indianapolis / Cambridge*.
3. Stark, J. 1938. “The Pragmatic and the Dogmatic Spirit in Physics”, pp. 770-772.
4. Retrieved from “<http://koleksyon-inip.org/what-is-dogmatism/>”, Dated: 09-02-2020.
5. Shields, P. M. “PRAGMATISM AS PHILOSOPHY OF SCIENCE: A TOOL FOR PUBLIC ADMINISTRATION”, *in Research* ***in*** *Public Administration,* Volume 4, pages **195-225.**
6. Rowbottom, D.P. 2011. “Kuhn vs. Popper on criticism and dogmatism in science: a resolution at the group level”. *Lingnan University*, Hong Kong.
7. Capaldi, N. 1992. “The Dogmatic Slumber of Hume Scholarship”. *Hume Studies*, Volume XVIII, (page 117- 135).
8. Retrieved from “<https://www.nonkantradiction.com/2011/05/what-does-kant-mean-by-dogmatism.html>”, Dated: 23-01-2020.
9. Fesmire, S. 2013. “John Dewey and Moral Imagination Pragmatism in Ethics”, *Indiana University Press.*
10. Retrieved from “<https://www.universetoday.com/38643/what-did-isaac-newton-discover/>”, Dated: 11-12-2019.
11. Einstein, A. 1920. “RELATIVITY THE SPECIAL & THE GENERAL THEORY A POPULAR EXPOSITION” (3rd ed. pp.55-58). *METHUEN & CO. LTD. 36* ESSEX STREET W.C. LONDON.

1. [Ribeiro](https://arxiv.org/search/physics?searchtype=author&query=Ribeiro%2C+M+B), M. B. and [Videira](https://arxiv.org/search/physics?searchtype=author&query=Videira%2C+A+A+P), A. A. P. 1998. “Dogmatism and Theoretical Pluralism in Modern Cosmology”. [arXiv:physics/9806011v1](https://arxiv.org/abs/physics/9806011v1).
2. Zettili, N. 2001. “Quantum Mechanics Concepts and Application.” (2nd ed.). WILEY*.*