

The Relationship between Progressivism Educational Philosophy and Science and Its Relevance in the Era of the Industrial Revolution 4.0 (Society 5.0)

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Article Info	Abstract
<p>Article History Received: 02 Jan 2023 Revised: 29 April 2023 Published: 30 April 2023</p> <p>Keywords progressivism educational philosophy; natural sciences; industrial revolution 4.0; society 5.0</p>	<p><i>Philosophy and science are human efforts to understand the concepts and methods of a scientific discipline. Changing times and developments have ushered in a philosophy of configuration by showing how the "tree of knowledge" thrives and branches out from the respective disciplines. This study aims to examine philosophy and science and their relevance in the Industrial Revolution 4.0 era. This research method uses the hermeneutic method in explaining the reality that occurs with elements of interpretation and description. The results of the research can be described that the study of the relationship between philosophy and science has developed so rapidly. Philosophy and science are indispensable in the development of science and technology which is marked by sharpening of scientific specialization, because by studying philosophy scientists are expected to be aware of its limitations so as not to get caught up in intellectual arrogance. It is impossible to fight against the discourse on the development of science and technology, but rather to reduce the negative impact of technology itself. In the era of the Industrial Revolution 4.0 and Society 5.0, community groups are heterogeneous, so that very complex problems arise related to technological developments and can change the mindset of human life to patterns of life that are more sophisticated with the power of technology. like robots and the internet. Thus, science which is used as an axiological milestone in directing and controlling the development of science and technology in a positive way for the benefit of humanity and its environment is philosophy and science.</i></p>
Informasi Artikel	Abstrak
<p>Sejarah Artikel Diterima: 02 Jan 2023 Direvisi: 29 April 2023 Dipublikasi: 30 April 2023</p> <p>Kata kunci filsafat pendidikan progressivisme; IPA; revolusi industry 4.0; society 5.0</p>	<p>Filsafat dan ilmu pengetahuan adalah upaya manusia dalam memahami konsep dan metode suatu disiplin ilmu. Perubahan zaman dan perkembangan telah mengantarkan filosofi konfigurasi dengan menunjukkan bagaimana "pohon pengetahuan" tumbuh subur dan bercabang dari disiplin ilmu masing-masing. Penelitian ini bertujuan untuk mengkaji filsafat dan ilmu pengetahuan serta relevansinya di era Revolusi Industri 4.0. Metode penelitian ini menggunakan metode hermeneutik dalam menjelaskan realitas yang terjadi dengan unsur interpretasi dan deskripsi. Hasil penelitian dapat digambarkan bahwa studi tentang hubungan antara filsafat dan ilmu pengetahuan telah berkembang begitu pesat. Filsafat dan ilmu pengetahuan sangat diperlukan keberadaannya dalam perkembangan ilmu pengetahuan dan teknologi yang ditandai dengan penajaman</p>

spesialisasi keilmuan, karena dengan mempelajari filsafat para ilmuwan diharapkan menyadari keterbatasannya agar tidak terjebak pada kesombongan intelektual. Tidak mungkin untuk melawan wacana pengembangan ilmu pengetahuan dan teknologi, melainkan untuk mengurangi dampak negatif dari teknologi itu sendiri. Di era Revolusi Industri 4.0 dan Society 5.0, kelompok masyarakat bersifat heterogen, sehingga muncul permasalahan yang sangat kompleks terkait dengan perkembangan teknologi dan dapat mengubah pola pikir kehidupan manusia ke pola kehidupan yang lebih canggih dengan kekuatan teknologi. seperti robot dan internet. Dengan demikian, ilmu yang dijadikan tonggak aksiologis dalam mengarahkan dan mengendalikan perkembangan ilmu pengetahuan dan teknologi secara positif bagi kemaslahatan umat manusia dan lingkungannya adalah filsafat dan ilmu pengetahuan.

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INTRODUCTION

Philosophy is the footing or foundation of human thought in the academic world as reasoning in seeking and exploring a science. Philosophy and science are continuously being transformed in order to solve the problems faced by the times. Since the birth and development of philosophy and science, it has played a big role/influence on the academic world. Historically the existence of philosophy and science continues to experience the dynamics of each periodization in order to meet the demands of the times. Fundamentally, there has been a change from previous thinking, so that an in-depth exploration was held to solve existing problems.

Social change triggers the emergence of a spirit of intellectual asceticism in society, from which it creates an intellectual ethos. This is what encourages people to continue to work and develop with new things in order to increase the prosperity of their lives, so that they become a modern society. The 17th century was marked by the outbreak of the Industrial Revolution which gave birth to modern society, which created various idealistic thoughts and views that had practical implications and had a major impact on people's lives at that time (Tasnur & Sudrajat, 2020). This change is not so surprising, because if you look closely at what has happened, the understanding that emerged in an era is usually the result of a response to a series of events that occurred side by side and strengthened one another. Centuries of church domination is the fundamental reason for the birth of positivism and is strengthened by the existence of secularism. The strengthening of this flow is more complete when liberalism which gave birth to capitalism uses positivism which is used as a tool to legitimize its existence in all elements of the life of modern society, so that indirectly the fundamental goals of philosophy gradually experience a shift from its substance goals.

Today the development of the era of modern society has reached the Industrial Revolution 4.0, where all wheels of people's lives are supported by sophisticated technology. Social behavior and patterns of people's lives have changed drastically as a result of the influence of the Industrial Revolution. Technological developments that gave birth to the era of the Industrial Revolution 4.0 not only opened up social interaction widely, but also disrupted various fields of human life (Prasetyo & Trisyanti, 2018). Whereas Society 5.0 is a human-centered and technology-based order of community needs (Fukuda, 2020). The Industrial Revolution 4.0 and Society 5.0 have presented a new order of life for society, in which all people's behavior will be made easy in fulfilling all elements of life.

This is the underlying problem of the impact of positivism or can be called a one dimensional man. This study was conducted in Frankfurt Germany, the results of the analysis explain modern society which is shackled by the existence of creations born by the flow of positivism and the way its view of truth is based on empirical evidence and scientifically tested.

This study then gave birth to a new understanding, namely the Frankfurt understanding, so that a problem emerged where the original goal of philosophy was actually considered not to cover all the needs of human substance.

Proverbs Bakhtiar's research (2012) suggests that substantially and historically philosophy and science have played an important role in exerting a major influence on human life. These two things cannot be separated from each other because they are integrated with each other. If traced philosophy and science play a role in bringing about changes in human civilization. Hidayatullah's research (2006: 234) explains that Greek civilization was the first place where philosophy was discovered. Along with the development of philosophy in ancient Greek society, they have changed their mindset from being mythcentric to being logocentric. The link between philosophy and science has a major influence on human knowledge of all things, this influence has brought changes to human civilization to a more advanced level, just like human civilization today (Tafsir, 2005). This study has the same concept as this research, but substantially the author examines philosophy in the current era (Industrial Revolution 4.0 and Society 5.0), philosophy must play a role in standing in order to be able to answer the demands of an ever-evolving era.

Based on the description above, the purpose of this article will be to focus and be more comprehensive on the relationship between philosophy and science and its relevance in the era of the Industrial Revolution 4.0 or Society 5.0. Hypothetically, philosophy and science have a relationship with each other, because both are typical thinking activities of humans. Philosophy and science are aimed at processes and results, when viewed from the results, both are the results of conscious human reasoning. When viewed from the process, it shows an activity that seeks to solve problems in human life, with certain methods and procedures in a systematic and critical manner. Just as in dealing with patterns of human life in the era of the Industrial Revolution 4.0 or Society 5.0, humans will think about using certain methods and procedures to deal with and undergo these changes.

METHOD

The method used in this article is a literature review with relevant reference sources. The analysis used is content analysis. First, identify various related sources; second, conducting content analysis techniques to find common threads from various sources; Third, draw conclusions.

RESULTS AND DISCUSSION

A. Philosophy and Science

The term "philosophy" is etymologically synonymous with the words *philosophia* (Arabic) and *philosophy* (English), derived from Greek (*philosophia*). The word *philosophia* is a compound word consisting of the words (*philos*) and (*sophia*). The word *philos* means lover, it can also mean friend. As for *sophia*, it means wisdom or wisdom, it can also mean knowledge (Rapar, 2001: 5). *Philosophia* literally means one who loves wisdom or a friend of knowledge. The term *philosophia* has been Indonesianized to become "philosophy", the adjective is "philosophy" and not "philosophical". When referring to the person, the correct word is "philosopher" and not "philosopher" (Suaedi, 2016). Unless the word "philosophy" is used instead of "philosophy", then the correct adjective is "philosophical", while what refers to the person is the word philosopher.

Philosophy is also a study of all the phenomena of human life and critical thinking which are described in fundamental concepts. Philosophy is not studied by carrying out experiments and experiments, but by posing problems in the same way, finding solutions for them, providing arguments and the right reasons for certain solutions. After briefly discussing the definition of philosophy (*philosophy*), it can be concluded that philosophy has an effort to find the truth about the nature of things that exist, through the optimal use

of reason abilities. The truth produced by philosophical thinking is an answer in the form of ideas or ideas. The goal of philosophy is to obtain basic and comprehensive truths in a conceptual system. Philosophy also produces truths that are abstract, speculative but unable to know how to do it.

Before discussing what science is, it must first examine the meaning of science and knowledge. Science comes from the Arabic word 'ilm, which means to understand, understand or know. Science refers to something beyond knowledge. In ancient times, those who were said to be knowledgeable were clearly people who were considered to have abilities that were obtained through certain conditions. People who are considered knowledgeable are people who pass the exam and the conditions that show the title of eligibility they have (Soyomukti, 2011: 152). Science is an activity of the mind to explain empirical reality specifically according to three main criteria: rational, methodical and systematic. Rational terms, it can be said that what is claimed by a science as the truth can be accepted because it makes sense, that is logical, critical, and open to improvement. So, what is rational is not immune to criticism (Poespwardojo & Seran, 2015: 9).

While knowledge includes all activities with the methods and means used as well as all the results obtained. In understanding "knowledge" we need to understand the act of "knowing". As the activities carried out by humans have consequences or results, so the act of "knowing" of course also produces something, namely "knowledge". Knowledge is all the results of activities to find out an object (can be a thing or event experienced by the subject), for example: knowledge about objects, about plants, about animals, about humans, or knowledge about war events (Wahana, 2016: 46). Knowledge is everything that is known which is obtained from the contact of the five senses to a particular object. Knowledge is basically the result of the process of seeing, hearing, feeling, and thinking that forms the basis of human behavior and action (Makhmudah, 2018: 203).

Science is an instinct of human reason which systematically creates new needs (theories) as the fulfillment of the desire for curiosity (Wilujeng, 2014: 104). Science (scientific knowledge) is a conceptual continuation of the characteristics of "inquisitiveness" as human nature. Human curiosity can be said to have no limits. Always want to seek and discover new things. In his life, humans are always faced with various events and environmental phenomena. both natural and human. Driven by curiosity, humans try to find the answer. Science continues to develop through studies conducted by scientists (Jalaludin, 2013: 91). Science is used as a basis for humans to seek new theories with certain methods and procedures in order to obtain predetermined goals. On the other hand, science must be systematic and orderly based on its objective methodology in order to achieve the desired scientific generalization.

Science results from a series of rational and cognitive human activities consisting of various methods in the form of various procedures and procedures so as to produce a systematic collection of knowledge regarding natural, societal or individual phenomena for the purpose of achieving truth, obtaining understanding, providing explanations, or carrying out application (Kirom, 2011: 102). Meanwhile, according to Surojiyo (2008: 57) the definition of science involves at least six kinds of components, namely problems, attitudes, methods, activities, conclusions, and effects.

Based on the description above, science, namely science aims to achieve scientific truth about certain objects, which can be obtained through certain approaches, methods, and systems. Knowledge can be created by humans because it is driven by human curiosity that is never ending towards objects, thoughts, or minds that doubt the testimony of the senses, because the senses are considered to often deceive. Science for humans has the possibility to achieve knowledge that is more perfect than ordinary knowledge, which has a higher degree that will provide "insight" (deep understanding).

In acquiring knowledge, there are three main issues that normally seekers of knowledge must pay attention to: (1) what does he want to know? (2) how to acquire knowledge? and (3) what is the value of this knowledge for him? In an effort to gain knowledge by answering some of these questions, humans will produce thoughts, one of which is science. Because science is one of the knowledge obtained by humans. Epistemologically, science is knowledge obtained through a certain process called the scientific method. This method is what distinguishes science from other ideas. So, knowledge is knowledge obtained by applying scientific methods (Hidayatullah, 2006: 131).

The foundation of science is mainly directed at the components that are the pillars for the existence of science, there are three kinds of pillars, namely ontology, epistemology, and axiology. a) Ontology is a theory of being and reality. Ontology is the science of nature, part of metaphysics which conducts investigations of its nature and reality. Ontology also studies nature and is used as a basis for acquiring knowledge or in other words answering the question of what is the nature of knowledge (Okasha, 2016: 277); b) Epistemology is a branch of the philosophy of science that deals with what we know and how to know it. So that epistemology here examines and tries to find the general characteristics and nature of human knowledge, how knowledge is obtained and tested for truth. The subject matter of epistemology includes the nature and sources of knowledge, methods of acquiring knowledge, and criteria for the validity of knowledge (Mufid, 2013: 20); c) Axiology is a science that investigates the nature of values which are generally viewed from a philosophical point of view. Axiology includes values, parameters for what is known as truth or reality, as our lives explore various areas, such as the social area, the physical material area and the symbolic area, each of which shows its own aspects (Komara, 2012: 14).

B. Relationship between Philosophy and Science

In the history of Greek philosophy, philosophy covers all fields of science. Gradually many special sciences separated themselves from philosophy. Nonetheless, philosophy and science still have a close relationship. Because both philosophy and science are both methodical, systematic, coherent knowledge and have material and formal objects. Philosophy and Natural Sciences are two related things. Historically, the birth of science began with philosophy, and vice versa, the philosophy of science is also growing along with advances in science and technology. In this case, human thought also experienced a linear development. In the past, the ancient Greeks based their thinking on myths, then developed to be more rational with their theological understanding, even this thinking continued to develop until it gave birth to science and technology which can be benefited to this day.

In addition, philosophy can also stimulate the birth of desires from philosophical findings through various observations and experiments that give birth to sciences. The results of philosophical work can be an opening for the birth of a science, therefore philosophy is also called the mother of science. In the interests of the development of science, a philosophical discipline that examines science was born, known as the philosophy of science. Philosophy of Science is part of Epistemology (philosophy of knowledge) which specifically examines the nature of science (scientific knowledge). Philosophy of science is closely related to the ontology, epistemology and axiology of science, in the sense that the philosophy of science tries to explain what objects are studied by science, by what process knowledge is obtained and for what knowledge is used.

What distinguishes philosophy from science is that philosophy studies all reality, while science only studies one reality or a particular field. Philosophy is the mother of all sciences. He contributed and played a role as the mother who gave birth to and helped develop science so that science could live and develop. Philosophy helps science to be rational in accounting for its knowledge. Accountability rationally here means that each

step must be open to all questions and objections and must be defended argumentatively, namely with objective (interjectively understandable) arguments.

C. Philosophy, Science and the Industrial Revolution 4.0 (Society 5.0)

The study of philosophy, science and the Industrial Revolution can be seen in depth through a historical approach. The development of the relationship between philosophy and science has progressed so intensely. The early history of philosophy in Greece includes almost all theoretical thought. In the development of science, if one looks at it conspicuously, there is another trend, because ancient Greek philosophy, which was once a single unit, became divided. With the advent of science in the 17th century, a separation between philosophy and science began. Before the 17th century, philosophy and science were inseparable from or synonymous with philosophy. In line with Van Peursen's opinion, he explained that in the past science was part of philosophy, so that the definition of science depended on the philosophical system it had adopted (Schrijvers, 2018).

Furthermore, in its development philosophy has ushered in a configuration by showing how the "tree of knowledge" has grown and flourished. Branches from each scientific discipline break away from the stem of philosophy, develop and follow their own methodology. Increasingly, the progress of science is increasingly visible with the emergence of new sciences and in the end raises new sub-sciences even as the age of scientific disciplines leads to more specific ones such as specialists.

Science in its development with an empirical approach according to Auguste Comte (1798-1857) which was written in his work *Cours de Philosophie Positive* teaches that the human way of thinking in society will reach its peak in a positive stage, after the theological and metaphysical stages. Positive terminology has an explicit meaning with philosophical content, meaning that what is true and real must be concrete, exact, accurate, and beneficial (Levine, 2018).

The scientific revolution continued in the 20th century with Einstein's theory of relativity which revolutionized Newton's philosophy which was originally considered established, in addition to his quantum theory which has changed the perception of science regarding the fundamental properties and behavior of matter, so that experts can continue their research and succeed in developing science. -Basic sciences such as astronomy, chemistry, physics, biology, molecular, as the results can be enjoyed by humans in the 21st century today.

The Industrial Revolution 4.0 was first sparked by German experts in 2011. The industry is currently entering new innovations, all production and industrial processes have developed rapidly (Savitri, 2019). Along with the development of science, the term Society 5.0 has emerged. This term was first coined by Japan in 2019 by carrying out the concept of forming a super smart society that has a pattern of behavior optimizing the use of the internet of things, big data, and artificial intelligence as a solution to the challenges of a more advanced society (Prasetyo & Trisyanti, 2018).

Savitri (2019) explains that the Industrial Revolution 4.0 and Society 5.0 are real movements for the increasingly sophisticated development of science and technology. This progress will be a challenge in itself for the behavior of people's lives, therefore to face the emergence of Society 5.0 an innovation and new breakthrough is needed in an effort to face the challenge of the impact of Society 5.0. The Japanese government adopted the concept of Society 5.0 in anticipation of global trends due to the emergence of the industrial revolution 4.0. Society 5.0 was indeed initiated for the answers and challenges that arose from the impact of the Industrial Revolution 4.0 which was accompanied by disruption marked by the current turmoil of uncertainty, complexity and ambiguity (Ibda, 2019).

The current situation and conditions are certainly very different from the past. Currently, human beings have understood and mastered science and technology in their lives. A way of life that is not based on a clear and well-established device is of course

impossible to maintain if you don't want to become a slave to science and technology itself, and if you don't want to become a human being with a future without direction (Maksum, 2015). So, sophisticated mastery of science with its predicate ability can help humans to manage life patterns in achieving a beautiful future. What is at stake as future generations must be prepared to train skills in order to continue wise and prudent leadership in managing life as a great and honorable nation. Thus, there is a great need for means to regenerate and educate prospective scientists to be wise and prudent. There is also a need for new innovations that underlie the development of science and technology so that their presence has more positive implications. Based on the hypothesis of the experts, that science which can be used as an axiological milestone in directing the positive development of science and technology for the benefit of humanity and its environment is philosophy and science. This is because philosophy and science are the foundation for thinking in order to determine a better direction in facing the challenges of the times, in the new pattern of human life.

D. The Relevance of Philosophy and Science in the Era of the Industrial Revolution 4.0 (Society 5.0)

The beginning of the development of philosophy was marked by mankind's plan to answer the problems surrounding nature, man and God. It was from there that the cause of philosophy was able to give birth to major sciences such as physics, biology, chemistry, ethics, mathematics and metaphysics which became the foundation for the formation of human civilization (Latif, 2014). So, it is clear to us that philosophy really plays a big role through its application in all areas of human life. There is no area of human life in this world that escapes the reach of philosophy.

According to researchers, the relevance of the relationship between philosophy and science in the current era of the Industrial Revolution 4.0 and Society 5.0 or known as the era of community disruption must remain vigilant of the times, because many problems will arise in postmodern society due to the massive development of science and technology itself. Science, both exact and social, has undergone a very rapid transformation and development due to criticisms of this science. Viewed from the other side, today's society has been confronted by a sophisticated era in which technology has expanded to all lines of human life.

Counter discourse on the development of science and technology cannot be carried out, but to be able to reduce the negative impact of the existence of technology. This can still be done by the community on condition that they are able to analyze their needs for technology. Today's society must be critical because the key to creating it is a harmonious and prosperous society in the midst of different needs between individuals. If it is returned to its original purpose by creating a critical society that can overcome all matters relating to life, in order to carry out changes in the wheel of life that rolls and is carried out quickly. Philosophical concepts can be used as a method of critical and independent thinking. This is in accordance with the challenges and changes of today's times which can only be faced creatively by individuals who are independent, critical and open to new opportunities. This philosophical concept will be able to make a very meaningful contribution to life. In line with Jurgen Habermas's thoughts that between science and human interests technically (technically), practically (practically) and emancipatorily (emancipatory) have a very close relationship to changing a better and more advanced society (Tasnur & Sudrajat, 2020). If applied in the life of industrial society, humanization and emancipatory goals will be realized (Semiawan, 2006). However, it needs to be understood that creating a society critical of the current situation requires deepening philosophical concepts to bring about changes in the pattern of life for a more advanced society.

Philosophy itself is used as a reflection by humans regarding the truth that can shape human character to be harmonious. Of course this is very relevant when applied in the era

of Society 4.0 towards a harmonious Society 5.0. In the era of the Industrial Revolution 4.0, the characteristics of the behavior of people's lives are marked by the development of the world of technology such as the internet, new technologies in data science, nanotechnology, and artificial intelligence. Humans in society must start with courtesy and balance, so that humans always change, develop, adjust themselves to the changing times.

CONCLUSION

Philosophy has bridged the birth of a multidisciplinary approach which is much needed, due to the limited and limited scientific study of physical reality which is actually multidimensional. Science is a series of rational and cognitive human activities consisting of various methods in the form of various procedures and procedures so as to produce a systematic collection of knowledge regarding natural, societal or individual phenomena for the purpose of attaining truth, obtaining understanding, providing explanations, or implementing . The reality of the relationship between philosophy and science is that both are the result of human thinking activities. Human activity is defined in a process and also in the results. When viewed from the results, all three are the result of conscious human thinking. When viewed in terms of the process, both show an activity that seeks to solve problems in human life (to obtain truth and knowledge), by using certain methods or procedures in a systematic and critical manner.

Philosophy and science are bridges for change and development in the world of science and technology. The current development of technology is known as the Industrial Revolution 4.0 and Society 5.0 where the pattern of human life has shifted from human labor to sophisticated technological power such as the internet, robots, artificial intelligence and computers. This is commonly known as the era of disruption because there will be many problems faced by society due to the massive development of science and technology. Even though it was started by humans in a polite society full of balance, humans are always changing, developing to adapt to existing changes according to the times. Counter discourse on the development of science and technology cannot be carried out, but to be able to reduce the negative impact of the existence of this technology. Today's society must be critical as a key in facing the challenges of the times and being able to analyze their needs for technology.

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