



# Multidimensional Science Paradigm in the Philosophy Integration of Ontology, Epistemology, and Axiology

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**Abstract**— Science and technology have an important role in maintaining the ecosystem of the universe. In science, the philosophy of science paradigm was put forward to integrate metaphysics with the physical, micro, and macro elements and the general with the. This study aims to explore the knowledge whose essence comes from thoughts about human philosophy, namely the basis of ontology, epistemology, and axiology. Deductive descriptive method was used to explain in general the view of science in the awareness of human moral formation from a dialectical process. The root of the multidimensional paradigm in examining a scientific truth in the dialectical process is by integrating the ontology, epistemology, and axiology aspects based on epistemic, scientific, and cultural values of society.

**Keywords**— Paradigm, Science, Philosophy Integration.

## INTRODUCTION

The scientific process runs systemically where all the stages are a unified system to get conclusions. Scientific conclusions are relative depending on the scientific process applied. One process cannot invalidate the other because they have different views and paths, but they complement each other to get a more complete and multidimensional truth. Philosophy of science in the form of a process of integrating the metaphysical with the physical, the metatechnical with the technical, the macro with the micro, and the general with the. The philosophy of science causes the necessary multidisciplinary approach to emerging because of the limited and narrow scientific study of physical reality which is multidimensional.

In addition, the philosophy of science is needed because scientific studies that are increasingly specific have resulted in science not being able to solve the problems of humanity and modern life which are getting more complex. The problems of humanity and life are multidimensional in nature that cannot be solved through a single scientific approach. According to Lannone (2001), the philosophy of science is a branch of philosophy that critically examines various concepts, problems, methods, scope, areas, practices, and results of science. The results of science can include scientific laws such as tools to solve scientific problems and scientific theories. Philosophy of science often produces new concepts and methods in overcoming scientific problems. It is a steppingstone in the development of an interdisciplinary study area that unites research concepts, methods, and practices of different disciplines. One example is the combination of

chemistry and biology to study the chemistry of biological organisms and processes at the molecular level. This combination proved successful by resulting in a new discipline, namely molecular biology.

Based on their order, humans as individuals have never been involved in the process of creating themselves. They are born from a couple having sexual intercourse, and then, by a natural process, a fetus is formed in the womb of the woman. Individually, someone is never offered to be conceived in the womb of a woman who eventually bears them. There is never an offer, a choice, not a will because they have not existed yet. No processes involve them. In the holy book of Muslims, the Qur'an, the existence of God is very functional, namely as the creator and the supporter of the universe and mankind. In addition, God is also a giver of guidance and a judge of humans both individually and collectively. God is one dimension that makes other dimensions possible by giving meaning and life to all of them (Rahman, 1994). This paper mainly talks about a multidimensional paradigm based on the aspects of human philosophy in examining a scientific truth in the dialectical process.

## **RESEARCH METHOD**

Science and technology work through a method in a predetermined design system. This study used the deductive descriptive method to explain in the general view of science in the awareness of human moral formation from a dialectical process. The design of a scientific study is preceded by a preliminary theory in the form of a hypothesis about an object to be the focus of the study, an initial assumption to be proven through appropriate and accurate trials to create a systematic theory, and technology in the reality of human life as a living practice with accountable benefits.

## **DISCUSSION**

### ***1. Ontology of Knowledge Forming Truth, Existence, and Reality***

Ideology is defined as a set of systemic concepts used as the principle of opinion (events) that gives direction and goals for survival (Hangabei, 2020). Ontology studies between existence and reality have different meanings because what exists does not have to be real, but what is real must exist. If there is something real, there is something empirical that can be measured, weighed, tasted, smelled, and exists in space and time, and there is a shape that can be drawn or photographed. There are empirical, physical, and material objects for the study of science and technology. In terms of concrete, first, there is something concrete that can be seen, touched, felt, weighed, and measured so that its shape can be determined, such as mountains, oceans, chairs, cows, etc. Second, there are abstract things that cannot be seen, touched, felt, weighed, and measured so that they can only be seen with abstract vision through concepts such as the existence of the Creator of everything. Meanwhile, what is real is part of what exists, which means there is a dynamic fact. This dynamic is influenced by the complex dialectic process of human life which includes social, political, economic, religious, and cultural aspects. Reality has dimensions of space and time so that it contains plurality and relativity.

The most important aspect of knowledge is empirical activity related to the real world of sensations. Although some established knowledge deals with various unobservable objects such as electrons, science and technology refer to the world around us. Knowledge seeks to understand the empirical world. It tries to find natural rules that are undamaged and blind. With the belief that the world follows a certain set of paths, knowledge seeks to grasp that fact. Because it seeks to understand the empirical world, knowledge involves the use of the law of effects of explanation in the sense that scientific explanations must be law-based and demonstrate that anything is examined by the real world so that a pure setting is open to empirical support that will not be taken seriously.

Therefore, there are always ups and downs of a culture or civilization anywhere just as there is growth and decay in the universe and death and life in humans. It is God in essence who grasps death and life, growth and decay, fall and rise of all these realities. The ups and downs of culture are due to the ups and downs of human character and morality. The growth and destruction of the universe occur because of human actions whose consequences will be imposed on themselves. Human death and life are in the hands of God.

The issue of the quality of science and technology will depend on the intellectual and moral qualities of humans. Human intellectual and moral qualities are formed in the educational process (formal, informal, and non-formal). Education takes place in the family, school, and community. Each has its function, role, and strength and will run dialectically. There should be a balance and harmony of education in the family, school, and community. In general, science and technology are developed from the world of education, especially in higher education at colleges or universities. Even now, research-based universities have been built everywhere. With the research of scientists at universities, science and technology will be developed because they can only develop and be developed through research (Gault, 2011). Without research activities, science and technology will stagnate, stop, and become out of date.

### ***Science and Technology as a Process***

Science and technology as a process is a thinking process to find rational, causal, and empirical truths in reality with the appropriate approach and method according to the physical object being thought of. As a thinking process, humans place themselves as subjects who carry out thinking, research, and testing the truth obtained in the study of the physical object as the focus. Science and technology activities are related to formal knowledge which is formed through research and development in higher education, research institutions, research and business development units, government laboratories, and private non-profit institutions.

The source of knowledge, science, and technology is the human mind. Without the human mind, science and technology will not exist and cannot be developed. Science and technology exist because of the human mind (Lawson, 2005). Knowledge and scientists are in a free position in the sense that scientific knowledge and activities are inventions without any kind of external coercion. In the pursuit of knowledge, scientists should be allowed to achieve their desires and satisfy their curiosity. However, given the increasingly

complex problems of society, the responsibility and benefits of knowledge and scientists are questioned. Knowledge is responsible for dangerous issues such as food poisoning due to degraded soil or lack of clean drinking water and so on. This responsibility can be realized by scientists with a concern for urgent problems in society and a desire to address them regardless of the fulfillment of personal desires, loss of individual financial benefits, or hindered opportunities for fame. Scientists who are given the freedom to research must also assume full responsibility for their discoveries and question the usefulness of their past and future activities for society.

Moral responsibility is inherent in the personality of a scientist and works systemically in his scientific studies to science as a process, as a product, and as a society. Science as a process has standard procedures to be met and followed in obtaining scientific truth. Meanwhile, science as a product can be controlled for the negative impact of its application in human life to prevent damage and disaster. Science as a society can give birth to a scientific community to strengthen scientific traditions, providing benefits and advantages by improving the standard of living of people to be more prosperous, sophisticated, and dignified. According to Resnik (1998), some scientists prefer to be role models in social responsibility. They dedicate most of their time to educating the public about science, increasing public interest in science, and informing the public about the consequences of research. Some scientists popularize science using their knowledge and expertise to support science and technology policies. This choice of scientists and activists has resulted in many organizations dedicated to educating the public about health care, nutrition, the hazards of home industries, and various environmental risks. For example, the public science center provides information about nutrition and health and negotiates with the legislative to regulate food labeling and advertising. Some scientific organizations, such as the Committee for the Scientific Investigation of Paranormal Claims and the Skeptical Society, also critically examine paranormal phenomena, false science, and prophecy. Scientists and scientific organizations have done many things for the good of society.

## ***2. Epistemology of Science and Change***

One of the characteristics of science and technology is change. Science and technology always change in human life as the subject and the research object. Both changes have implications for methodological changes to get to the truth. Thus, the truth of science changes from time to time. Humans from time to time always live and change as a person and as a society (Greenwood, 2008). As a person, the change occurs within the human being from birth, growth, to death. There are physical changes as humans are born. They are weak and completely dependent on others to take care of them. For changes in growth, as humans become teenagers, they have the physical strength to live independently, grow strong, and be independent.

Civilizations the lives of nations in the past have been able to enrich people's views to design a better future life. However, the peaks of civilization fell not because the study of science and technology fell, but it is due to the crisis in human life. With the changes in the quality of morals and characters as subjects of changing science and technology, humans use science and technology for their interests used as a tool of war and conflict that are deadlocked and cause social massive damages and disasters.

Science and technology are always dependent on the quality of their subjects. If the subjects have high moral and character qualities, science and technology can elevate civilization. On the other hand, if science and technology are in the hands of unqualified subjects, it will become a tool and force that destroy life and civilization.

### ***3. Axiology of Science***

Science and technology are inseparable from values because they embody the values. In addition, science and technology also have very important values in human life because humans can use them to deal with the challenges in their lives. Without science and technology, humans will encounter many difficulties in their lives. Science and technology will extend the power and greatness of human civilization. The conception of value-free science and technology is not entirely acceptable for two reasons. First, science and technology also reveal epistemic values combined with cultural values in practice. Second, values can also be objective when they require communal justification and must be based on accepted principles. Science and technology are related to values in three ways. First, the existence of epistemic values guides scientific research; second, scientific efforts are always bound to a certain culture, and cultural values are included in science and technology through the individual actors of science and technology; third, values emerge from science and technology as a product and a process and are widely redistributed in culture and society. Thus, the context of customs or habits is integral from the values of the results of the thought, creativity, and sense of community that is often referred to as culture (Achmadi, et al, 2020). The achievements of science and technology are an implicit attestation of the value of developing knowledge of the material world.

Science and technology are seen as a success and a power so that everything related to them can gain authority or value. In addition, science and technology have an image as a model for all problem-solving. Science and technology, on the one hand, are recognized as the effective cure for all social problems and are considered the main methods for objectivity, even when other values are involved. Although not all problems can be solved by science and technology alone, they must be integrated with ethical and social values. Science and technology can help identify relevant consequences or invisible interrelationships to ethical values or principles (Allchin, 1999).

### ***4. Multidimensional Reality of Science***

In this life, humans are faced with various realities, and humans are part of the reality which has a central role. With their creativity, humans can make changes to the reality they face. In essence, the reality of life is in an internal mechanism that is controlled without any human intervention. However, in the development of human civilization, because of the creativity that enables humans to change the existing reality, the autonomy of natural law will deal with human autonomy.

The change and formation of natural reality into a new reality in culture and civilization require humans to understand the laws of nature to explore and transform them into new useful forms for life. For example,

mountains containing gold in Papua can be excavated and processed into gold bars, which are then traded to be made into jewelry and other very high-priced tools. The reality of the golden mountain has finally become an object of contested and bloody conflict, and its control has led to violent conflict and very high social inequality. Thus, with a central role of humans who truly abilities, conflict and inequality among humans will never happen.

### ***5. Multidisciplinary Approach as an Alternative***

Humans and the universe have a dialectical relationship. Humans are part of the universe, called the micro cosmos, which represents the appearance of God. Humans have the elements of macro cosmos and God that allow them to form culture and civilization from the material elements in the universe. Culture and civilization are processes and forms of human existence (Kaplan & Manners, 2012).

The dialectic relationship between humans and the universe creatively forms a culture and civilization, and the ups and downs of culture and civilization in history are of human existence. History has recorded the peaks of high culture and civilization which experienced downfall and destruction and moved from one nation/region to another.

### **CONCLUSION**

Culture and civilization can be viewed as the same thing, namely as instruments, customs, and institutions of social groups. Culture is the intrinsic value of a society. A multidimensional paradigm based on aspects of human philosophy in examining a scientific truth in the dialectical process is by integrating the ontology, epistemology, and axiology aspects based on epistemic, scientific, and cultural values of society. As an alternative to prevent the fall of culture and civilization, multidimensional approach is needed by maintaining the process and formation of human culture and civilization with the universe.

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