

History Of The Development Of Science

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Journal info

Jurnal Pendidikan Glasser

p-ISSN : 2579-5082

e-ISSN : 2598-2818

DOI : [10.32529/glasser.v7i1.2172](https://doi.org/10.32529/glasser.v7i1.2172)

Volume : 7

Nomor : 1

Month : 2023

Abstract.

The type of research that the author uses is a type of qualitative research using a content analysis approach (Content Analysis), or what can be called a content study. This analysis is a research technique for making a conclusion or inference that can be replicated and the correctness of the data by taking into account the context. The object of this research is explored through various information in the form of books, interpretations, journals. The history of science, which is a long process of growth and development of science itself, cannot be separated from its existence. Something brand-new with characteristics specific to that era emerges at each stage of the development of science. The social dynamics of a cultural conflict have led to these characteristics. Obviously, this can't be isolated from different social, social and political impacts that create alongside the advancement of science itself. Thus, the ancient Greek, Islamic, Renaissance, Modern, and Contemporary periods the ancient Greek period, the Islamic period, and the Renaissance and Modern Period can be used to categorize the development of science.

Keywords:

The development of science, Greece ancient, Islamic period, renaissance and modern, and period contemporary

A. INTRODUCTION

In fact, periodic examination of the progress of a science has a very wide and long degree. In a perfect world, history would be a written record of every series of events, stating everything based on facts. On the other hand, sometimes it only reveals part of the series of events or fails to reveal the whole series and cannot be separated from it. Certain social and political conditions. that's why they don't understand it. In addition, periodization or the history of scientific progress that has a significant impact on human life is the subject of this history. As a result, serious efforts

were required to discover previously unknown historical facts.

The development of science is always associated with Greek civilization in terms of theory. This is supported by several things, such as Greek literature and mythology, the influence of modern science in the Ancient East, and Greek mythology. The evolution of human thought from myth to rationalism determines how science develops over time. In fact, periodic examination of the progress of a science has a very wide and long degree. In a perfect world, history would be a written record of every series of events, stating everything based on facts. On the other hand,

sometimes it only reveals part of the series of events or fails to reveal the whole series and cannot be separated from it.

Gordon Childe wrote, "What mankind has done over the last five thousand years in different parts of the world is a very sporadic and incomplete record in written history"(G.Childe, 1975) In theory, history should be a record of every series of events. Place, serves as a true disclosure of everything without the slightest distortion. However, in practice, history only reveals a part of the chain of events and cannot be separated from politics. the machinations of the rulers. remain because they will affect future generations as additional historical actors. In addition, the history in question is the history of science, an important component of human existence. Therefore, serious efforts are needed to present history as well as academic and moral obligations.

According to the religious view, knowledge originates from the first human Adam (Qs.Al-Baqarah : 30-33), and then develop into knowledge or science. Knowledge is essentially the result of human curiosity. This desire for information arises from the ever-increasing demands of life.

So that readers are not confused with the purpose of the description, the author needs to provide a brief explanation of the differences in knowledge and knowledge in the history of this work so that readers can easily understand it. Knowledge is a collection that can be measured, clarified, and verified empirically. Knowledge, on the other

hand, includes all unwritten information about physics and metaphysics. It can also be said that knowledge is information in the form of common sense, and science has become a part of it because of its special methods and mechanisms (Bakhtiar, 2010). So While not all science is knowledge, it is more specific than knowledge.

Given the brief description above, we can assume that science, not information, is the term used here. Different disciplines. Information is divided into three general classes by Maskoeri Jasin. First of all, sociology, which includes subjects such as brain science, teaching, humanities, ethnography, history, and social sciences. Second, innate science (herbal science, zoology, morphology, living systems, physiology, cytology, histology, and fossil science), which combines physical science, science, and science. Third, Earth and Space Sciences, which combines cosmology, topography (natural topography and topography), and geography (petrology, volcanology, and mineralogy). The Creator only cares about the various individuals who are behind the logical hypotheses and their progress due to the breadth of knowledge (Jasin, 2003). The author only focuses on the history of the development of several sciences, which are documented or recorded by existing historical literature. Due to the wide scope of knowledge, the author mentions several figures behind the discovery of scientific theory and its development.

Philosophy has historically been the foundation of science. As science develops, it becomes increasingly specific and autonomous; however, given the many issues in life that science cannot address, philosophy becomes the foundation for addressing them. A substantial and radical explanation or solution to the issue is provided by philosophy. Despite the fact that science continues to develop within its boundaries, it continues to face severe criticism. The philosophy of science can be seen as an effort to bridge the gap between philosophy and science so that science does not despise philosophy and philosophy does not view science as a superficial understanding of nature. Because this process or interaction is basically the field of study, the philosophy of science can be seen as an attempt to do so.

Philosophy of science is an effort to study and deepen knowledge (science), whether it is the characteristics of its substance, its acquisition, or the benefits of knowledge for human life. In essence, philosophy of science is a philosophical study of matters related to science. This research is inseparable from the major philosophical references found in the fields of ontology, epistemology, and axiology, where experts have made numerous advancements and deepened their understanding.

B. RESEARCH METHOD

The type of research that the authors use is qualitative. Which qualitative research is a research method based on the philosophy

of postpositivism, used to examine the condition of natural objects, where the researcher is the key instrument, and the results of qualitative research place more emphasis on a meaning (Sugiyono, 2011).

While the approach used in this study is the content analysis approach (Content Analysis) or also known as content study. This analysis is a research technique for making a conclusion or inference that can be imitated and the data is correct by paying attention to the context (Burhan Bungin, 2008). The object of this research is explored through a variety of information in the form of books, commentaries, journals

C. RESULTS AND DISCUSSION

1. Ancient Greek Period

The site of an ancient civilization is called ancient Greece. Because of this, ancient Greece is often associated with philosophy, which laid the foundation for science. On the other hand, philosophy as a whole was practiced and developed long before the classical Greeks did. Under their direction, philosophy developed into something very useful for the next generation of knowledge. This is similar to opening the door to various fields that are still relevant today. The sudden rise of civilization in Greece, according to Bertrand Russell, is the most astonishing and difficult to explain event in history. In fact, Egypt and Mesopotamia have had many civilizations over thousands of years. However, the Greeks had to perfect

several aspects before they were considered complete (Russell, 2004).

Because it was a very important time in human history, the era of Greek philosophy was very important for the history of human civilization. Science emerged as a result of this process, starting with philosophy and ending with technology. Greek philosophy developed was the entry point towards a new human civilization. Humans can use reason to investigate and simultaneously challenge themselves and the universe from this point of view (Bakhtiar, 2010).

The first natural philosopher to study the origins of nature was Thales (624-546 BC). Heraclitus (540-480 BC), Anaximanders (610-540 BC), Parmenides (515-440 BC), and Pythagoras (580-500 BC). follow it. Thales, also known as the "father of philosophy," showed that nature began with water. The first chapter, according to Anaximander, is eternal, endless, and contains everything that the apeiron calls not just water and earth. Heraclitus observed, as usual, that the universe is always changing. He looked at factors and realities, especially fire, not as real substances in the world. Parmenides, in contrast to Heraclitus, argued that reality is a single static entity.

Pythagoras showed that numbers were not only measures but also a fundamental part of nature. A number has even and odd, finite and infinite elements. Pythagoras made significant contributions to the progress of science, especially the exact and natural sciences. The mathematical method underpins

the current state of science (Tafsir, 2005). So every philosopher has a different view of the world. Differences are not always bad, on the contrary, they are full of scientific treasures. Apparently, the next generation was inspired by some of their ideas.

Following their dissatisfaction with the naturalist response, a number of sophist philosophers emerged. These philosophers turned their attention from nature to man. They believe that their most important feature is Protagoras, who lived from (481-411 BC) and said that man is the measure of piety. The leader of humanism is this vision. He argues that truth is subjective and relative. Ethics, metaphysics, and religion will not have absolute standards as a result. To be honest, he had not imagined that the numerical hypothesis was correct in every way. The other is Gorgias, who lived from (483-375 BC). He stated that sensing is suspect. It increases illusion. Because our minds have been deceived by the dilemma of subjectivity, we cannot be convinced about the universe by reason. The sophist movements had a positive effect because they promoted philosophical thought. They do not provide definitive answers to questions of metaphysics, religion, and ethics (Bakhtiar, 2010).

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2. Islamic period

The command word iqra which means "read" begins the message of the Qur'an in sura al-'Alaq which was first revealed to the Prophet Muhammad. This indicates that Islam

is actually a teaching that upholds science. According to Joseph Schumpeter, the "dark ages," or time periods in the history of economic thought, lasted 500 years. The intellectual spirit of the Islamic world emerged at a time when Europe and the West were in a dark place. Because many Western economists at that time stole the ideas of today's Muslim economists, the West tried to hide the fact that the dark period was actually the heyday of Muslims (Schumpeter, 1954).

Science developed rapidly in the East at that time, especially in areas controlled by Islam. Throughout Europe in the Middle Ages, the civilization of the Islamic world translated extensively the works of Greek philosophers and made other scientific discoveries that focused more on religious issues (Mustansyr, 2002).

Harun Nasution emphasized that the classical Islamic period (650-1250 AD) saw the development of science. Perception of how high the rank of reason is influences this knowledge, according to the Qur'an and hadith. This perception is compatible with other Greeks. perception through Greek philosophy and science in the cities of the centers of world Greek Islamic civilization in the Classical Age, such as Alexandria (Egypt), Jundisshapur (Iraq), Antakia (Syria), and Bactra (Persia) (Nasution, 1998). W. Montgomery Watt goes into more detail, saying that during the Arab occupation of Iraq, Syria, and Egypt in the seventh century, Greek science and philosophy flourished in various centers of learning. Alexandria,

Egypt, is home to a famous school. However, around 900 AD, they were relocated first to Syria, then to Baghdad (Watt, n.d.).

Arab works in botany, zoology and mineralogy include descriptions and lists of various rocks, animals and plants. When it comes to pharmacology and medical treatment, for example, few of them have practical applications (Watt, n.d.).

In addition to the disciplines mentioned above, some Muslims are also involved in logic and philosophy. Call it al-Kindī, al-Fārābī (d. 950 M), Ibn Sīnā or Avicenna (d. 1037 M), al-Ghazālī (d. 1111 M), Ibn Bājah or Avempace (d. 1138 M), Ibn Ṭufayl or Abubacer (d. 1185 AD), and Ibn Rushd or Averroes (d. 1198 AD) (Watt, n.d.). According to Felix Klein-Franke, al-Kind is credited with making Greek philosophy and science available and laying the foundations for Islamic philosophy from this obscure and difficult source. Some of these foundations were later continued and developed by al-Frabi Al-Kind was concerned about this as he often opposed orthodox theologians who emphasized bringing Greek philosophy and science to their Arabic-speaking neighbours (Klein-Franke, 2003). Christian philosophy, according to Bertrand Russell, is closer to Ibn Rushd than Islamic philosophy. Islamic philosophy has finished, but Christian philosophy has only just begun. In Europe, he had a significant influence not only on scholastic thought but also on a number of non-professional liberals who were called Averroists and opposed to

eternity. His admirers included professional philosophers at the University of Paris and the Franciscans in particular (Russell, 2004). Ibn Rushd's rationalism inspired the medieval West and helped revive their civilization, which had declined over the centuries, leading to the Age of Enlightenment or Renaissance.

3. Renaissance and Modern Period

The famous historian Michelet was the first to use the Renaissance. The term is often used by historians to describe various intellectual awakenings, especially those that occurred in Europe and Italy in the 15th and 16th centuries. Renaissance, modern era, and medieval era. The Renaissance may have ended the Middle Ages. Some claim that the modern era is simply an extension of the renaissance. Between the end of the Dark Ages and when the Dark Ages began. The Renaissance period is a period of development of civilization in the modern era. During the Renaissance, many important scientific advances and changes occurred. The main characteristics of the Renaissance are humanism, individualism, secularism, empiricism, and rationalism. The spirit and results of empiricism are blamed for the development of science, while the spirit of humanism is blamed for the abandonment of Christianity (Tafsir, 2005).

During the Renaissance, which lasted from the 15th to 16th centuries AD, scientists discovered the following: Johans Kepler (1571-1630 AD), Galileo Galilei (1564-1643 AD), and Francis Bacon (1561-1626 AD) were Nicolaus Copernicus (1473 M). –1543).

The theory of heliocentrism, which states that the sun, not the earth, is the center of the universe, discovered by Copernicus (1473-1543). He said that the earth moves in two ways: once a year, it moves around the sun, and once a day, it rotates on its axis. Astronomy and the way we think about the universe changed as a result of this theory (Bakhtiar, 2010). Kepler, a German astronomer, was influenced by Copernicus' ideas. It was he who discovered that the orbits of the planets are ellipses; it is when they are close to the sun, the planets move quickly, but when they are far from it, they move slowly. Telescopic observations by Galileo, an Italian astronomer, confirmed Copernicus' hypothesis that the sun was the center of the solar system. His discoveries were feared by the Inquisition, which forced him to stop studying astronomy. laws of acceleration, motion and trajectory of a bullet. He was the discoverer of the planet Jupiter, which revolves around it for four months (Bakhtiar, 2010).

In addition, inventors related to modern science (17-19 centuries AD): Joseph Black (1728-1799 AD), Joseph Priestley (1733-1804 AD), Leibniz (1646-1716 AD), and Sir Isaac Newton (1643- 1727 AD).M), J.J. Thompson, and Antoine Laurent Lavoisier (1743-1794 AD). The theories of gravity, optics, and calculus, all of which are the basis for the natural sciences, were developed by Newton. Mathematical physics, astronomy, and other sciences developed at that time. Newtons. After that, chemistry became an interesting

field of study. Black discovered CO₂ gas and was a pioneer in qualitative analysis. Priestley discovered that plants can produce nine types of air, including oxygen. Chemistry as we know it today was invented by Lavoisier. The electron was discovered by J.J. Thompsons. With this discovery, the idea that atoms are the smallest matter disappeared and a new field of study known as nuclear physics emerged within the framework of chemistry and physics. Taxonomy, economics, calculus and statistics were all developed during the 18th century, while pharmacology, geophysics, geomorphology, paleontology, archeology and sociology were developed during the 19th century (Bakhtiar, 2010). The development of contemporary science is influenced by modern science at a later stage.

4. Contemporary Period

The development of science in the modern era which began around the 15th century is what distinguishes it from the contemporary era which is characterized by the most recent developments to date. Scientific advances at this time include sociological sciences, such as social sciences, humanities, brain science, finance, law and government and accurate sciences such as physics, science and science and their use in the fields of design and innovation. Genetic reconstruction, information and communication, deconstruction, technological progress and the modern era are all synonymous (Bakhtiar, 2010).

The social sciences, exact sciences, and pre-existing philosophical theories are usually

the targets of reconstruction and deconstruction, while technological progress is advancing at an ever-increasing pace, as we witness and enjoy today. Over time, the advancement of science has led to the development of technology. At the time Faraday invented the computer, its applications were unknown. The computer is the development of electricity (electronics). After Edison invented the light bulb, computer, radio and television (Jasin, 2003). They started with computers and then became lap tops, computers (also known as personal computers), and eventually computers of a different type, such as personal digital assistance (PDAs) computers (Bakhtiar, 2010). All these examples show that the technological breakthroughs produced by advances in science are related to earlier, smaller but more useful breakthroughs.

Genetic engineering in the form of cloning technology is one of the most surprising and controversial technological results. The first person to use this technology was Dr. Gurdon from the University of Cambridge in 1961. Gurdon succeeded in influencing the growth of tadpole cloned frog eggs. In 1993, Dr. Jerry Hall successfully cloned human embryos using fission techniques. In 1997, Dr. Ian Wilmut successfully cloned the first animal, a sheep he named Dolly. That same year, Gene's first cloned cow was born. Dr. In 1998, Teruhiko Wakayama's group at the University of Hawaii cloned five generations of mice. In 2000, Prof. Gerald Schatten succeeded in

creating a clone of a monkey tetra. After a number of different cloning methods were successful, experts made additional preparations to apply the technique to humans (Bakhtiar, 2010).

D. CONCLUSION

The history of science, which is a long process of growth and development of science itself, cannot be separated from its existence. Something brand-new with characteristics specific to that era emerges at each stage of the development of science. The social dynamics of a cultural conflict have led to these characteristics. Obviously, this can't be isolated from different social, social and political impacts that create alongside the advancement of science itself. Thus, the ancient Greek, Islamic, Renaissance, Modern, and Contemporary periods the ancient Greek period, the Islamic period, and the Renaissance and Modern Period can be used to categorize the development of science.

The development of science cannot be separated from genuine curiosity, efforts to experiment, improve, and take many risks to produce useful discoveries for past generations and references for future generations. Knowledge can only grow as a result of this. These factors then encourage the rapid development of science and technology.

We realize that scientific progress has both positive and negative impacts on human life; consequently, a balance needs to be struck between scientific progress and human moral and spiritual growth. The good effect is to make people's life better. easier, while the negative impact becomes increasingly dangerous.

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