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The Importance of Teaching Elementary Students about the History of Science Development

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Abstrak

Sains memberi perubahan nyata bagi perkembangan hidup manusia, termasuk pendekatan ilmiah dalam proses pembelajaran di sekolah. Penelitian ini bertujuan untuk mendeskripsikan urgensi mempelajari sejarah perkembangan sains bagi anak usia dasar. Jenis penelitian ini termasuk kualitatif dengan metode studi kepustakaan. Sumber data dikutip dari laman kredibel berupa *Google Cendekia* dan *Sinta*. Adapun data penelitian meliputi buku, artikel, prosiding dan tugas akhir (skripsi, tesis, atau disertasi) yang relevan dengan topik penelitian. Untuk menguji keabsahan data, maka peneliti mengkroscek kembali bahan penelitian. Hasil penelitian ini menyimpulkan bahwa sejarah perkembangan sains penting untuk diberikan kepada anak usia dasar, karena bermanfaat bagi peningkatan wawasan anak serta menginternalisasi nilai sikap menghargai sejarah kepada anak sejak usia dasar. Adapun implikasi dari penelitian ini mengajarkan kepada anak tentang konsep dasar, sejarah, hingga manfaat sains dalam kehidupan sehari-hari.

Kata Kunci: Anak Usia Dasar, Konsep Dasar Sains, Perkembangan Sains.

Abstract

Science provides real change for the development of human life, including a scientific approach to the learning process in schools. This study aims to describe the urgency of studying the history of science development for elementary-age children. This type of research includes a qualitative method of literature study. Data sources are quoted from credible pages in the form of *Google Scholar* and *Sinta*. The research data includes books, articles, proceedings, and final assignments (thesis, or dissertation) that are relevant to the research topic. To test the validity of the data, the researcher cross checked the research materials. The results of this study concluded that the history of the development of science is important to give to children of primary age because it is useful for increasing children's insight and internalizing the value of respect for history to children from an elementary age. The implications of this research teach children about basic concepts, history, and the benefits of science in everyday life.

Keywords: Elementary Children, Basic Concepts of Science, Development of Science.

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INTRODUCTION

Science is a way of thinking that describes and gives meaning to the real world with objectivity, and has principles of organization and systematization. The following are signs of science, that truth is not absolute, cumulative, or objective. The six stages of scientific development are as follows: Pre-Ancient Greece, Ancient Greece, Middle Ages, Renaissance, Modern Age, and Contemporary Period are the various periods (Ekawati, 2017).

We are aware that the development of science is represented by the history of science, which has a broad and long scope. History should in theory be a record of the entire series of events, with the intention of presenting everything according to the facts without the slightest distortion. However, history often fails to do so because it sometimes reveals only part of the sequence or not at all. As a whole, regardless of it, of course it is also influenced by certain political and social conditions (Rosyidi, 2016).

In addition, the history or periodization of the development of science, which is an aspect of human life, is the subject of this discussion. Therefore, a significant effort is needed to reveal the existing historical facts. The religious perspective states that science originates from the creation of Adam and develops into science or science. Science is basically rooted in human curiosity. The ever-increasing demands and needs of life trigger this curiosity (Sidik, *et.al.*, 2013).

Revealing science, philosophy is needed as the parent of science. Philosophy is a broad science, so philosophy is closely related to our daily lives. In fact, philosophy can be said to be the driving force behind our daily lives as individuals and as a society or a nation. Philosophy of science is a philosophical reflection of the nature of science, which knows no stopping point in pursuing truth and reality. Understanding the philosophy of science requires understanding the intricacies of science so that its most fundamental aspects and connections are also understood from the perspective of science, its development potential, and the interrelationships that exist between various disciplines (Lailiyah, 2020).

Theoretical development of science is always associated with Greek civilization. This is supported by several things, such as Greek literature and mythology, the spread of knowledge to the Ancient East at that time, and Greek mythology. More rational than mythical, this is what led to the rise of science in every age. When people study and research nature, they become more active and creative. As a result, the author of this short article describes the history of the development of science according to his expertise and abilities, even though the author's beliefs are still far from perfect (Lestari, *et.al.*, 2022).

The development of the history of science or science is inseparable from the role of educators who seek to give birth to superior generations from time to time. Of course, students are the main target that continues to receive main attention in the educational process as candidates for superior human resources in the future. Consolidating education aimed at students requires the complexity of teaching about science. It is based on a scientific or scientific process of learning (Azhar, 2017).

Teaching science to elementary age children has been taught since elementary education. Where natural science material (IPA) becomes cumulative and associative material for teaching science to children. In this context, science provides an opportunity for every student to explore their abilities by being friends with nature. That is, students are asked to observe natural phenomena naturally, ask the teacher about interesting or new things they know, then collect and associate findings, and finally communicate back the scientific or scientific processes that have been passed by students.

In fact, relevant research on the history of scientific development has been examined from various scientific perspectives. Among them discusses the aspect of scientific development according to experts (Jena, 2012), development of Islamic science in the Abbasid era (Muksin, 2016), contribution of scientists to the advancement of modern science (Jailani, 2018), the development of Islamic perspective science (Fauzi & Chudzaifah, 2019), teaching and learning of 21st century history for students (Baharuddin, *et.al.*, 2016), science

development methodology (Muslih, 2017), the treasures of science in Islam (Aji, 2014), the impact of scientific developments from a review of secularism (Sakti & Mu'tasyim, 2021), epistemology and ethics of science (Nugroho, 2016), formation of national character through Islamic science (Mujiburrahman, 2018), philosophical discourse on science (Muslih, 2014), and development of science based on religious ethics (Latif, 2016).

Based on the summary above, it is clear that prior relevant research studies have highlighted scientific studies from the perspective of philosophy, Islamic science studies, the development of Islamic science during the caliphate, and the contribution of thought leaders (scientists) to the development of science. However, there is a study gap analysis that needs to be done because it does not address the advantages of teaching elementary school students about the development of science. Based on this, the goal of this research is to present the fundamental ideas of scientific learning and the procedures that are suitable for the requirements of primary school pupils.

METHOD

In this study, library research was used as a data collection method. This literature study aims to collect data from reading, taking notes, and processing the materials found for research. This type of library research is also called literal qualitative research. The data collection method is a study of books, literature, notes, and scientific articles related to the subject matter of the study (Assingkily, 2021). With a total of 28 references from reliable Google Scholar sources, the data are taken from scholarly papers in Google Scholar and Sinta indexed scientific journals. This study employed a descriptive qualitative research methodology. The qualitative research approach is, first and foremost, easier to modify to the reality being studied. Second, this approach's meeting room allows researchers to speak with the topic of their research directly. Finally, this method is more flexible and sensitive to how values evolve in the research topic. The research subjects were then explained and described in terms of the field settings.

RESULTS AND DISCUSSION

History and Fundamental Science Ideas

Philosophy as the mother of science becomes an innovative impetus for science in human life. Through philosophy, each individual is not only directed to seek goodness and truth, but also a high degree of wisdom, so that philosophers are seen as human beings who love wisdom. On this basis, wisdom starts from the aspects of mind, heart, attitudes and actions that bring benefit to the surrounding environment (Rahayu, *et.al.*, 2021).

Talking about the birth and development of philosophy at the beginning of its birth cannot be separated from the development of science that was born in ancient civilizations (during the time of Greece). In the history of philosophy, Greek philosophy generally forms the basis of the history of Western philosophy, because the Western world (Western Europe) in its natural sense comes from the Greek way of thinking. At that time there were claims about the existence of the universe and its inhabitants, but this knowledge was based on faith. Researchers think that they are not satisfied with this information and then try to find information through their minds (Fardiana, 2017).

Pre-Socratic philosophy is characterized by a search for the origins (principles) of things. Isn't there only one principle behind the multiplicity of realities in the universe? Thales suggests: water, Anaximander: infinite, Empedocles: fire-air-earth. Heraclitus taught that everything is always changing ("panta rei" = always changing), while Parmenides said that reality does not change at all. But the question remains: how did he appear in the form of many, and how many are really only one? Pythagoras (580-500 BC) knows of two schools of thought which he founded to consider this. Democritus (60-370 BC) is known for his concept of the atom as the basis for this explanation (Nurcholis, 2021).

The Greek Age culminated in the philosophical thought of Socrates (70-399 BC), Plato (28-38 BC) and Aristotle (38-322 BC). In the 5th century BC, the Greeks had a belief system that everything must be accepted

as coming from myths or fables, meaning that truth according to reason (logic) is not valid, but truth that comes from myths (fables). After the 6th century BC a group of thinkers emerged who opposed the existence of myths. They want questions about the mysteries of this universe, the answers are acceptable (reasonable). Situations such as demythology, or the awakening of thought to use the mind and abandon things that are basically mythological. In the search for masters of thought, it leads to freedom of thought, therefore many try to conceptualize. Based on the pure collective power of thought, magical events are born, Greek miracles, which means they can be used in the world as the basis of civilization (Wedra, 2015).

The creator of philosophy is the mind and the enemy is the heart. The conflict between mind and heart is basically the content of the history of philosophy. In the history of philosophy it seems that the mind wins, sometimes it loses, the heart wins, it also loses, and both win. Throughout history, there has been a struggle between the two for control of human life. Mind here means a wise mind. In fact, there are three factors that gave rise to Greek philosophy explained as follows;

First, Greek society is rich in myths (fairy tales), where myths are considered as the beginning of human efforts to know or understand. These myths are then arranged systematically so that they appear rational while, resulting in selective and rational myths, such as the poems of Homer, Orpheus, and others. Second, a work of Greek literature that can be considered as the impetus for the birth of Greek philosophy, Homer's works have a very important place in the Greek way of life, which includes educational values. Third, the influence of the sciences from Babylon (Egypt) in the Nile Valley, because of their talents and abilities, these sciences were developed in such a way that they studied not only practical aspects, but also creative theoretical aspects (Ali, *et.al.*, 2021).

With these three elements, logos (reason) changes the place of fantasy so that after this change a way of thinking is formed. The term "age of natural philosophy" was commonly used to describe this period in ancient Greece. It is said that this period saw the emergence of natural thinkers, who asked philosophical (reason-based) and unfounded questions about natural phenomena. Their minds are directed and focused on the observable. During mitosis They discovered the absolute first principle of the universe, or arche, which is the cause of all change. Miletus, a Greek overseas city on the coast of Asia Minor, is the birthplace of the first Greeks. philosopher. They want to know what's behind all this material and are captivated by the nuances and rituals of nature.

The Importance of Teaching Elementary Students about the History of Science Development

Similar to the myths held by the Greeks, philosophy first appeared as a form of mythology at an early stage. It was only after Thales (62-58 B.C.) posed this strange question that philosophy took on a rational form. Mind (it would be very interesting). The question Thales asked out of curiosity was not your typical one: how does coffee taste? or what year does the coffee plant produce fruit? Thales asked, "What questions about what matter of nature?" in this universe, which is a philosophical question because it carries significant weight in some of the highest senses. what are the properties of objects? in the universe? The senses and science cannot provide an answer to this question, but philosophers have attempted to do so (Maimun, 2019).

His concept of man is also based on the theory of hylemorphism. According to this theory, humans are composed of matter and form. Form is soul, and since form is never separate from matter, when people die, their soul (form) dies too. Aristotle is also known as the father of logical logic, namely a way of thinking based on causal relationships or in the correct sequence. He was the first to develop a systematic way of thinking in systems based on syllogisms (Rusdiana, 2014).

The history of the development of science has various dynamics that should be taught to every generation of wisdom. This is based on survival efforts that need to be passed on to elementary age children. Why does it have to be elementary age children? Because, at that age phase, the mind is still fresh to become the forerunner of the individual's life processes in the future. In addition, through understanding science, children are directed

to the paradigm of scientific thinking from the basics (Barlia, 2011). Scientific thinking skills are strongly supported by the development of science itself (Amin, 2017).

For kids in primary school, teaching them about the development of science is an important subject. This is so that kids can withstand learning more and not be aware of the term "poor mood in learning," as they will understand that there are dynamics in the learning process. Also, elementary school students are taught that everything that occurs is part of a system or is essential to it and cannot occur on its own. Because everything is based on a scientific methodology, this type of pattern will teach kids to think logically. So, learning about the history of science aids elementary-aged kids in their exploration of knowledge via a scientific lens.

This is so because individuals must possess both basic and advanced science knowledge in order for science to advance. Children can use this ability to get around the demands of their environment. For instance, not all learning resources are available when studying science content in class, therefore pupils must use their creative thinking to fill in the gaps. In the practical sense, the teacher must help with this.

CONCLUSION

According to the explanation given above, it can be inferred that teaching elementary-aged kids about the history of science is crucial because it helps them gain more perspective and internalize the importance of respecting history. Children are taught about fundamental ideas, history, and the practical applications of science through the research's ramifications.

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