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Philosophy Of Mathematics And Mathematics Education

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Abstract

Philosophy of mathematics is a branch of philosophy that studies philosophical assumptions, foundations, and effects of mathematics. The aim of the philosophy of mathematics is to provide a record of the nature and methodology of mathematics and to understand the place of mathematics in human life. The field of knowledge called the philosophy of mathematics is the result of philosophical thought whose goal is mathematics itself. The main concern of the philosophy of mathematics is to provide an explanation of the nature of mathematics.While the philosophy of mathematics education is a philosophy that discusses the process of mathematics education. Mathematics education refers to the problem of learning and teaching. The philosophy of mathematics forms the philosophy of mathematics education, meaning that the philosophy of mathematics education is supported by the philosophy of mathematics. Towards learning in mathematics education, philosophical thought has a very important role. Philosophy also plays a role in creating a mathematics learning that allows students to build their logical thinking and build their mathematical knowledge. The philosophy of mathematics forms mathematics education, meaning that mathematics education is supported by the philosophy of mathematics. Thus, Philosophy of mathematics is a branch of philosophy that studies philosophical assumptions, foundations, and effects of mathematics. The aim of the philosophy of mathematics is to provide a record of the nature and methodology of mathematics and to understand the role of mathematics in human life.

Keywords: Philosophy, Mathematics And Education

INTRODUCTION

In modern life, philosophy is defined as a science that seeks the nature of things, seeks to interpret interpretations of human experiences and is an attempt to answer questions that arise in various fields of human life. Philosophy is an attitude of someone who is aware and mature in thinking about everything in depth and wants to see from a broad and comprehensive perspective with all relationships. Philosophy is also defined as the view of life of a person or group of people which is the basic concept of the life that is aspired to. The answer is a result of basic thinking and is used to solve problems that arise related to aspects of human life, including aspects of education. In principle, the concept of philosophy puts something of truth based on the ability of human reason, which is a benchmark for an event that occurs before and after it. Mathematics is a branch of science that has emerged from centuries ago, mathematical

problems arise differently in each particular era both in the times of Mesopotamia, Babylon, Egypt, and Greece. It was from these countries that they tried to learn and study more about mathematical problems. They do it in an abstract and idealistic way. They try to find out the fact that science is fixed or changing, such as the figure who believes that science is permanent is Permenides and the figure who believes that science is changeable is Heraclitos. From this, various intuitions emerged so that a philosophy of mathematics education emerged. This is also based on the fact that finding the philosophy of mathematics is by thinking extensively, i.e. thinking as broadly as possible and thinking with intent, i.e. thinking deeply. According to the background, the formulation of the problem in this journal is as follows: 1) What is the philosophy of mathematics?, 2) What is the philosophy of mathematics education?, 3) What is the relationship between philosophy and mathematics? And 4) What is the position of philosophy in science and human life?

RESEARCH METHODS

The research method is literature review or literature study, which contains theories relevant to research problems. The problem in this research is to find out philosophy, mathematics and education. In this section, an assessment of the concepts and theories used is carried out based on the available literature, especially from articles published in various scientific journals. Literature review serves to build concepts or theories that form the basis of studies in research. Literature review or literature study is an activity that is required in research, especially academic research whose main purpose is to develop theoretical aspects as well as aspects of practical benefits

RESULTS AND DISCUSSION

A. Philosophy of Mathematics

Philosophy of Mathematics itself is a specific form of epistemology (which generally discusses the origin of knowledge and how human knowledge is formed), where Philosophy of Mathematics discusses the origin of mathematics and how a system of mathematical knowledge is formed. Philosophy of Mathematics has a very important function, which is to provide a strong and systematic foundation for mathematical knowledge and truth (Ernest, 1991). As a consequence, students who fail in the Philosophy of Mathematics course will have difficulty in understanding the nature of mathematics comprehensively. Philosophy of mathematics is a branch of philosophy that studies philosophical assumptions, foundations, and effects of mathematics. The aim of the philosophy of mathematics is to provide a record of the nature and methodology of mathematics and to understand the place of mathematics in human life. The field of knowledge called the philosophy of mathematics is the result of philosophical thought whose goal is mathematics itself. Philosophy and mathematics have no doubt that from the past until now these two fields of knowledge are very closely related.

Opinions of mathematicians and philosophers on what is the philosophy of mathematics. An example can be taken in the formulation of 2 mathematics books and 2 philosophy dictionaries, namely as follows:

1. Philosophy of mathematics can be described as a point of view in which parts and pieces of mathematics can be arranged and put together on the basis of principles.
2. A philosophy of mathematics is tantamount to the assembly of a chaotic collection of mathematical knowledge accumulated over centuries which is given a certain meaning.
3. The study of the concepts of justification of the principles used in mathematics.
4. The study of the concepts and systems contained in mathematics, and of the justification of mathematical statements.

Philosophy of mathematics is a part of philosophy that talks about mathematics and examines the assumptions, foundations, and implications of mathematics philosophically (Hers, 1997). The philosophy of mathematics provides an accountability regarding the nature and methodology of mathematics in human life It is so important that the philosophy of mathematics is mastered by students so that later when students become teachers, they can convey mathematical material comprehensively.

Details of the field of philosophy of mathematics that can be put forward and are expected to be more systematic include the following sections:

1. Epistemology of mathematics
   Mathematical epistemology is a theory of knowledge whose object of study is mathematical knowledge. Epistemology as one part of philosophy is a reflective thought on various aspects of knowledge such as possibility, origin, nature, limits, assumptions and foundations, validity and reliability to the truth of knowledge. Thus the mathematical foundation is the main subject of mathematical epistemology.

2. Mathematical ontology
   Ontology has recently been seen as a theory of what exists. The relationship between the ontological (or metaphysical) view and mathematics has caused quite a number of problems which have been discussed by some philosophers of mathematics. In mathematical ontology, the scope of mathematical statements is questioned (covering a real world or not). The view of empirical realism answers that the scope is a reality. The existence of mathematical entities is also the subject of philosophical thought. To this philosophical problem, the Platonic view answers that the real points and lines exist in the transcendent world which is now only remembered by the human soul in this world, while the Aristotelian conception suggests that these entities do exist in the empirical world but must be distilled by abstraction. Another thing that is a related problem is whether mathematics was invented by man or created by his mind. The opinion that considers mathematics as an invention implies that the axioms of mathematics are necessary truths which are already beyond human influence.

3. Mathematical axiology
   Mathematical axiology consists of ethics which discusses the aspects of truth, responsibility and role of mathematics in life, and aesthetics which discusses the beauty of mathematics and its implications for life which can affect other aspects, especially art and culture in life. Mathematical axiology is very much contributing to changes in human life in this mortal

universe. Everything science in this world cannot be separated from the influence of mathematics. From a technical point of view, mathematics has a very important role in technological progress. With mathematics, human civilization developed from a simple and unpretentious civilization to a modern civilization with a scientific and technological pattern.

B. The Relationship Between Mathematics and Philosophy

Philosophy and education are two things that cannot be separated, both in terms of the process, path, and purpose. This is very understandable because education is essentially the result of philosophical speculation, especially on the philosophy of values, which is related to the inability of humans to avoid their nature as self who always crave meaning – similarities in processes, ethical spaces, and pragmatic spaces. On the one hand, humans have always been the only primates who always call for kindness, love, and truth. However, at the same time, humans are also the only creatures who can kill themselves and each other so for no reason at all, other than just for fun. In this space, education for human life becomes an important thing to bring it to a meaningful life. With education, humans will be able to live their lives well and Correct. Humans can laugh, cry, talk, and be silent taking the right measurements. In a simple sense, education is often interpreted as a human effort to build his personality in accordance with the values in in society and culture. In development, educational terms or pedagogic means guidance or help intentionally given by an adult to become an adult. Next, education defined as a business run by another person or group of people so that become an adult or reach the level of life or higher livelihood in the sense of mental. Mathematics was never born from philosophy, but both developed together by giving each other problems as input and feedback. In the historical trajectory of the two twin sisters of philosophy and mathematics, they grew up together under the tutelage of the philosopher and mathematician Pythagoras (572-497 B.C.).

1. Philosophy and mathematics have a close relationship, among others:
2. Philosophy and geometry (a branch of mathematics) were born at the same time, in the same place, and from a single father, around 640-546 BC, in Miletus (located on the west coast of present-day Turkey) and from the mind of a man named Thales. .
3. Mathematics was never born from philosophy, but both developed together by giving each other problems as input and feedback.
4. The existence of a reciprocal relationship and mutual influence between philosophy and mathematics was also stimulated by the philosopher Zeno of Elea. Zeno discussed the paradoxes related to the notions of motion, time, and space which later for centuries confused philosophers and mathematicians.

Thus from the beginning until now philosophy and mathematics have continuously influenced each other. Philosophy encourages the development of mathematics and vice versa mathematics also spurs the growth of philosophy.

Based on philosophy, education has an interest in building a philosophy of life so that it can be used as a guide in living daily life. Henceforth, daily life is always in order. So to education, philosophy contributes in the form of a thorough awareness of the origin, existence, and purpose of human life. Without philosophy, education cannot do anything and does not know what to do, on the contrary, without education, philosophy remains in its utopia. Therefore, a teacher must understand and explore philosophy, especially the philosophy of education.

Through educational philosophy, teachers knowing the nature of education and education can be developed through the philosophy of ontology, epistemology, and axiology.

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C. The Relationship Between Philosophy of Mathematics and Mathematics Education

The philosophy of mathematics includes ontology and epistemology. Ontology concerns the nature of mathematics, what is the essence behind mathematics. While epistemologically it is related to how to answer questions about mathematics, how to obtain and capture problems in mathematics.

In the philosophy of mathematics there is a range of perspectives which may be termed 'absolutist'. These view mathematics as an objective, absolute, certain and incorrigible body of knowledge, which rests on the firm foundations of deductive logic. Among twentieth century perspectives in the philosophy of mathematics, Logicism, Formalism, and to some extent Intuitionism, may be said to be absolutist in this way (Ernest 1991, 1998). Absolutist philosophies of mathematics are not descriptive philosophies, but are concerned with the epistemological project of providing rigorous systems to warrant mathematical knowledge absolutely (following the crisis in the foundations of mathematics of around 1900). Many of the claims of these philosophies – let me refer to them together as absolutism - follow from the identification of mathematics with rigid logical structure introduced for epistemological purposes. Thus according to absolutism mathematical knowledge is timeless, although we may discover new theories and truths to add; it is superhuman and ahistorical, for the history of mathematics is irrelevant to the nature and justification of mathematical knowledge; it is pure isolated knowledge, which happens to be useful because of its universal validity; it is value-free and culture-free, for the same reason.

Thus although it exceeds its intended scope, absolutism suggests a philosophically sanctioned image of mathematics as rigid, fixed, logical, absolute, inhuman, cold, objective, pure, abstract, remote and ultra-rational. If this is how many philosophers, mathematicians and teachers view their subject, small wonder that it is also the image communicated to the public, and in school. In my view, the philosophy of mathematics is at least partly to blame for this negative image, because of its twentieth century obsession with epistemological foundationalism.

Mathematics education refers to the problem of learning and teaching. Towards learning in mathematics education, philosophical thought has a very important role. Philosophy also plays a role in creating a mathematics learning that allows students to build their logical thinking and build their mathematical knowledge.

CONCLUSION

Based on the explanation above, the writer concludes that the philosophy of mathematics is a branch of philosophy that examines philosophical assumptions, the basics, and the effects of mathematics. Its aim is to provide a record of the nature and methodology of mathematics and to understand the place of mathematics in human life. While the philosophy of mathematics education is a philosophy that discusses the process of mathematics education. Mathematics education refers to the problem of learning and teaching. The philosophy of mathematics forms the philosophy of mathematics education, meaning that the philosophy of mathematics education is supported by the philosophy of mathematics. Towards learning in mathematics education, philosophical thought has a very important role. Philosophy also plays a role in creating a mathematics learning that allows students to build their logical thinking and build their mathematical knowledge. Thus, the philosophy of mathematics forms mathematics education, meaning that mathematics education is supported by the philosophy of mathematics. Philosophy of mathematics is a branch of philosophy that studies philosophical assumptions, foundations, and effects of mathematics. The aim of the philosophy of mathematics is to provide a record of the nature and methodology of mathematics and to understand the role of mathematics in human life.

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