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PANCASILA'S CRITIQUE OF PAUL ERNEST'S PHILOSOPHY OF MATHEMATICS EDUCATION

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Abstract

Indonesia has recently faced problems in various aspects of life. The results of a social media survey in Indonesia in early 2021 that the biggest threat to the Pancasila ideology is communism and other western ideologies. Communism has a dark history in the life of the Indonesian people. It shows the problem of thinking and philosophical views of the Indonesian people. This research is textbook research that aims to analyze philosophy books, namely mathematics education philosophy textbooks written with a Western cultural background by Paul Ernest. This book was chosen as the object of analysis because this book is the essential reference textbook for the philosophy of mathematics education in universities providing prospective mathematics teachers in Indonesia. The research results show that this book contributes to developing Western thoughts that are contrary to Pancasila. It needs to eliminate the most critical thing in this book. It is the atheistic and individualistic philosophy underlying the ideology of mathematics education because this is not in line with the theistic collectivistic Pancasila. Therefore, this research recommends developing a textbook on the philosophy of mathematics education. It should be under the Pancasila ideology or written based on the Pancasila ideology.

Keywords: Paul Ernest, Philosophy of Mathematics Education, Pancasila

1. INTRODUCTION

Indonesia has recently faced various serious problems related to the values and identity of the Indonesian nation. Arif (2021) reports that in early 2021 a survey of Indonesian social media has been carried out. The results show that 95.9% of respondents answer that Pancasila is appropriate to be the basis of the Republic of Indonesia. However, the problem is in the application of Pancasila values. The majority of respondents (49%) states that people have not implemented the values of Pancasila properly. The most dominant reason is that corruption is getting bigger (25%). Meanwhile, regarding the existence of threats to Pancasila, 42.9% of respondents answer that there exists. The biggest threats to Pancasila in question are communism (15.1%) and the desire to change Pancasila (to trisila and ekasila) (14.1%). The results indicate that there exists public concern about the spread of Western thought in Indonesian society, such as communism, individualism, materialism, and others. Western thought and culture easily spread to Indonesian society, due to the strong current of globalization (Nurhaidah and Musa 2015; Cahyono 2017; Arjoni and Handayani 2017; Alwi 2019; Hermawan S. 2019; Agustinah and Indriyani 2019; Shofiyah 2020; Saodah et al. 2020; William 2021; Listiana 2021).

According to the Deputy for Strategic Studies of the Indonesian National Defense Institute, Prof. Dr. Reni Mayerni, Pancasila is an open ideology. That is an ideology that is open to absorbing new values that are beneficial for the survival of the nation. However, national vigilance must remain against the new ideology. Because if Indonesia is not careful, then people will tend to follow the flow of foreign ideologies, while the original ideology of the Indonesian nation itself, namely Pancasila, will be forgotten, both its values and its implementation in everyday life (Permatasari 2020).

The strengthening of Western thought and culture and the weakening of the internalization and practice of Pancasila have contributed to various phenomena in Indonesian society. Let say,

for example, the burning of the pulpit of the mosque, the Mushaf of the Qur'an, and the prayer rug (Mappiwali 2021) which indicates a problem with the practice of divine values. Previously, last year there was the murder of the priest Jeremiah (Tempo 2020) and the murder of members of the Islamic Defenders Front (Mangihot 2021) which indicates problems in the practice of human values. In addition, the Papuan student alliance in Surabaya demands regional independence (Rafika 2020) which indicates a problem of nationalism and the practice of the value of unity. Also, the House of Representatives ratified the Draft Job Creation Act into law, even though many parties from the people still refused (Rosana 2020) which indicates there are problems in implementing the value of deliberation and consensus. Equally important, the corruption of billions of rupiah in social assistance funds by unscrupulous officials during the crucial conditions of the people during the COVID-19 pandemic (CNN Indonesia 2020) indicates a problem of social justice.

Some of the phenomena above show that Indonesian people have forgotten the values of Pancasila and no longer implement them in everyday life. It shows the need to inculcate the concept of Pancasila as the philosophy of life, ideology, and identity of the Indonesian nation. The strong influence of globalization which has eroded the values of Pancasila has encouraged Policy Analyst of the Directorate of High Schools of the Ministry of Education and Culture of the Republic of Indonesia, Dr. Juandanilsyah, to recommend Pancasila to be taught and strengthened through Pancasila and citizenship education subject with an emphasis on theory and practice (Permatasari 2020). However, for mathematics educators, such as Swadener and Soedjadi (1988), this kind of problem is not only the responsibility of Pancasila educators and religious educators but also the responsibility of all educators in various disciplines. This is a shared responsibility and therefore an erroneous assumption when educators in other disciplines, such as mathematics educators, are considered irresponsible in this matter.

We are in line with the opinion of Swadener and Soedjadi (1988) that even mathematics educators are responsible for instilling the values of Pancasila. As mathematics educators in universities, we want to prepare prospective mathematics educators who have a philosophical view that is under Pancasila as the personality of the Indonesian nation. For this reason, we view that the philosophy of mathematics education course can be one of the right places to prepare prospective mathematics educators who have the expected philosophical views. This is because mathematics has philosophy and ethics that can be a means of shaping personality so the philosophy and ethics of mathematics should even be included throughout mathematics teaching activities at all levels of education from school to university (Ernest 2018).

The philosophy of mathematics education plays a significant role in analyzing, questioning, opposing, and even criticizing the claims of mathematics education practice, policy, and research (Ernest 2018). The phenomena that occur in Indonesian society mentioned above have attracted our attention to criticizing mathematics education policies as such the use of a textbook, “The Philosophy of Mathematics Education” by Paul Ernest at universities providing mathematics teacher candidates in Indonesia. It is because it contains pure Western theory to be read by prospective Indonesian mathematics educators, without any filter based on the ideology of Pancasila. Tilaar (2012) states that we feel that research on the educational process today is still very lacking in Indonesia. Thus many concepts of education are copies of Western concepts. This statement also describes the poor condition of research on the philosophy of mathematics education in Indonesia.

The restructuring of the teacher education program from the Institute of Teacher Training and education to university should provide greater opportunities to research in the field of education (Tilaar 2012), including mathematics education. Because of the importance of the position of textbooks on the philosophy of mathematics education, as well as the differences in cultural backgrounds between the West and Indonesia. So, we want to research to analyze the textbook "The Philosophy of Mathematics Education" by Paul Ernest. This is the first step in filtering destructive foreign cultures to maintain the personality of the Indonesian nation (Al Munir 2013), in which Pancasila is the filter (Yudhanegara 2015). The purpose of this study is to reveal the Western thoughts contained in Paul Ernest’s textbook and see the possibility of things that need to be developed.

2. METHODS

2.1 The Type of Research

This was textbook research. This study was used because the researchers would like to assess the suitability of the philosophy of mathematics education textbook used in lectures with Pancasila.

2.2 Timeline and Place of Research

This research was conducted at the Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, having its address at Mallengkeri Street, Makassar City, South Sulawesi Province, Indonesia. This research was carried out in the Even Semester of the academic year 2020/2021 to the Odd Semester of the academic year 2021/2022 for about nine months.

2.3 Research Object

The object of this research is the textbook “The Philosophy of Mathematics Education” by Paul Ernest.

2.4 Research Procedure

The steps of this textbook research were adapted from Pingel (2010) as follows.

First, setting up a research group. At this stage, the researchers prepared the people who would be involved in this research. In this study, the researchers involved despite the first author were two lecturers of the philosophy of mathematics education course in the Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar along with a lecturer or an expert in mathematics education research.

Second, the pedagogical environment. At this stage, the researchers recognized the pedagogical environment. That is, the prevailing

education system and the general framework of the courses are to be developed by the general ideology or educational philosophy adopted by Indonesia. Thus, it could be stated that the prevailing education system is a national education system with an educational philosophy based on Pancasila.

Third, defining the sample. At this stage, the researchers determined the textbook and its type to be assessed. From the existing philosophy of mathematics education textbooks, the researchers determined the textbook of the philosophy of Mathematics Education by Paul Ernest as that to be assessed. This is because this book is one of the main references for Higher Education Institutions for Educational Personnel in teaching the philosophy of mathematics education.

Fourth, analysis. After selecting and determining the philosophy of mathematics education textbook to be assessed, the next step was to determine the analytical method to be used. Any particular subject-oriented text could be analyzed from two general points of view, namely: didactic analysis. This analysis aimed to identify the methodological approach to the research topic and explored the pedagogy behind the analyzed text; (b) content analysis. This analysis aimed to assess the text itself, what was conveyed by the text to us; whether the text was following academic studies or the results of scientific research conducted by experts related to the topic under study; and did this text adequately cover the required topics? Of the two types of analysis, which was used in this study was content analysis. This is because this research wanted to see whether or not it is necessary to develop the content of the philosophy of mathematics education.

Fifth, formulation of the conclusions and results. This is the next stage after doing content analysis. The formulation of conclusions and analysis results, namely: (a) providing an overview of the philosophy of mathematics education and methodological approaches applied in the textbook being analyzed; (b) identifying items removed from the philosophy of mathematics education textbook and discussing the controversial issues in it; (c) formulating recommendations on how to improve the quality of presentation of the assessed mathematics education philosophy textbook. Furthermore, the proposal to change the content of the textbook and the method of presentation was adjusted to the fundamental concepts of education that applied in Indonesia.

Sixth, textbook recommendations. At this stage, recommendations for the analysis of the philosophy of mathematics education textbooks were included to proceed to the next stage of this research, namely the development of the textbook. The presentation of the textbook recommendations was in classic form. This is because it provided a clear direction of how a textbook on the philosophy of mathematics education should be, without alternatives that were sometimes confusing. In this form, a summary of the most important findings from the analysis of the philosophy of mathematics education textbook was included which formed the basis for proposals for a more balanced change for the philosophy of mathematics education textbook.

3. RESULTS AND DISCUSSIONS

This section can be described as follows.

3.1 An Overview of the Philosophy of Mathematics Education and Methodological Approaches Applied in the Textbook "The Philosophy of Mathematics Education" by Paul Ernest

3.1.1 An Overview of the Philosophy of Mathematics Education in Paul Ernest's The Philosophy of Mathematics Education Textbook

This book consists of two parts. The first part of this book deals with the philosophy of mathematics. It contains a critique of the philosophical approach that has existed so far, namely mathematical absolutism, in which it views mathematics as a collection of objective and infallible truths, and has nothing to do with humanity and its values. In addition, it also provides a proposal for a new philosophy of mathematics by Paul Ernest, namely social constructivism. The emergence of Ernest's proposal is because the traditional paradigm that views mathematics as absolute and certain knowledge is attacked by philosophers and mathematicians, but the new ideas that dominate and promise in the spirit of change have not been synthesized. Social constructivism exists as an offer to fill that void.

The second part of this book explores the philosophy of mathematics education under the philosophy of life and politics in England, in particular, namely individualism. Many aspects of mathematics education rest on underlying philosophical assumptions. Mathematics teaching and curriculum are two aspects of mathematics education that are based on philosophical assumptions. Therefore, at the beginning of the second part of his book, Ernest first investigates the philosophy relevant to mathematics education by considering the values, ideologies, and social groups attached to that philosophy.

For Ernest, the views of various groups about the position of mathematics in the field of education and society are very important. Even the views of various circles about the position of mathematics in these two fields are more important than the others. This is because if mathematics is seen as an objective knowledge that cannot be wrong, then it is not relevant to talk about social problems, such as problems related to women, the sense of cultural alienation from mathematics that is felt by many groups of students, the relationship of mathematics to human affairs as the transmission of social and political values, the role of mathematics in the distribution of wealth and power. On the other hand, according to Ernest, if it is recognized that mathematics is a social construction that can be wrong, then social construction is seen as a process of investigation to find out human creations and inventions that continue to develop. With social construction, mathematics is not seen as the final product.

Views about mathematics affect the views on mathematics education. According to Ernest, a dynamic view of mathematics such as social constructivism has strong educational consequences. By viewing mathematics as a social construction, mathematics

learning should aim to empower students so that they create their mathematical knowledge because mathematics can be discovered and reshaped even in schools. With social constructions, all social groups have ample access to mathematical concepts, as well as the wealth that mathematical knowledge and power bring. Thus, the social context of the use and practice of mathematics should no longer be ruled out.

The implicit values of mathematics, such as the abstract, formal, objective, and so on, need to be dealt with wisely. When mathematics is seen as a social construction, according to Ernest, then it needs to be studied in a meaningful and relevant life context for students. This includes learning mathematics in the context of their language, culture, and everyday life, as well as their school-based experiences. This view of mathematics provides a logical rationale, as well as the foundation for a multicultural and women-friendly approach to mathematics. Overall, mathematics is responsible for its uses and consequences, both in the field of education, as well as in the social one. We in the world of education, according to Ernest, have special reasons for wanting social constructivism as a more humanist or more humane view of mathematics. With a more humanistic view of mathematics in the field of education, this view will strengthen students.

3.1.2 Methodological Approach Applied in The Philosophy of Mathematics Education Textbook by Paul Ernest

In the introduction to his book, Ernest indirectly acknowledges the methodological approach in presenting his book. Ernest adapted Higginson's (1980) approach. According to Higginson (1980), mathematics education is the same as psycho-philo-socio-mathematics. Higginson's view of mathematics education influenced Ernest's methodological approach in his book. Some forms of influence of Higginson's views can be seen in the presentation of the contents of his book.

In part I of his book, it can be seen at least the following two things. First, the presentation of the conflict of thought among philosophers of mathematics in the early 20th century between absolutism and fallibilism which is considered to be able to influence the practice of mathematics education shows the importance of the philosophy of mathematics for mathematics educators. Ernest says "Much is made of the absolutist-fallibilist distinction because, as is shown subsequently, the choice of which of these two philosophical perspectives is adopted is perhaps the most important epistemological factor underlying the teaching of mathematics".

Second, Paul Ernest's proposal on the uncertain epistemological problem of mathematics with the feud between absolutism and fallibilism, namely social constructivism as a philosophy of mathematics shows that the social point of view influences him. He explains this in the introduction to his book, "The under participation of sectors of the population, such as women; the sense of cultural alienation from mathematics felt by many groups of students; the relationship of mathematics to human affairs such as the transmission of social and political values; its role in the distribution of wealth and power; none of these issues are relevant to mathematics". Subsequently, in Chapter 3 Social Constructivism as a Philosophy of Mathematics, he elaborated further on mathematics, as in his Introduction to his book, "if it is acknowledged that mathematics is a fallible social construct, then it is a process of inquiry and coming to know, a continually expanding field of human creation and invention, not a finished product. Such a dynamic view of mathematics has powerful educational consequences. mathematics is a fallible social construct, then it is a process of inquiry and coming to know, a continually expanding field of human creation and invention, not a finished product. Such a dynamic view of mathematics has powerful educational consequences". Paul Ernest's suggestion about Social Constructivism as a Philosophy of Mathematics is based not only on his sociological and psychological views on mathematics. Another reason is that on the one hand, there is a critique of the dominant absolutist philosophical view of mathematics. On the other hand, there is no new philosophical view that has been synthesized as a new paradigm for mathematics. Ernest also appeared to offer his view as a paradigm that could be used as a view of mathematics to fill the vacuum.

In the second part of his book, Ernest put forward an educational ideological model for mathematics. In the model of education ideology, it can be seen that in general there are two elements, namely primary elements, and secondary elements. The primary elements are epistemology, philosophy of mathematics, moral values, children's theory of social theory, and educational goals. While the secondary elements are the objectives of mathematics education, school mathematics knowledge theory, mathematics learning theory, mathematics teaching theory, mathematics learning assessment theory, mathematics education resource theory, mathematical ability theory, and social diversity theory in mathematics education. All items presented in these two elements can be classified into Higginson's (1980) meaning of mathematics education, namely psycho-philo-socio-mathematics.

3.2 Items to be removed from the Philosophy of Mathematics Education textbook by Paul Ernest

In this book, the ideology of mathematics education in England as a representation of the ideology of Western mathematics education is viewed from Pancasila as the identity of the Indonesian nation. The ideology of mathematics education is central and fundamental. Showing that there is a problem with the ideology of mathematics education adopted has an impact on the need to conduct a critical review of other aspects of mathematics education that rely on that ideology. The results of the study show that the ideology of Western mathematics education is atheistic individualistic. This is not in line with the theistic collectivistic Pancasila. Thus, in the Indonesian context, the ideology of Western mathematics education needs to be removed or revised in such a way as to be relevant to Pancasila as the ideology of mathematics education in Indonesia.

The following is an argument for rejecting the ideology of Western mathematics education in the context of mathematics education in Indonesia.

Society as the context for writing The Philosophy of Mathematics Education textbook by Paul Ernest is Western society, especially British. The philosophy and way of life of British society is individualism (Pamudji 1995). The philosophy of life of a nation is inseparable from the philosophy of education held in it (Sadulloh 2018). Therefore, we need to know the philosophy of individualism to know the philosophy of mathematics education in Ernest's book.

In the Cambridge Dictionary (2021), individualism is referred to as "the idea that freedom of thought and action for each person is the most important quality of a society, rather than shared effort and responsibility". That is, individualism is the understanding that freedom of thought and action for everyone is the most important quality of a society. The most important quality of society according to this view does not lie in shared responsibility and joint effort.

In addition, Lukes (2021) refers to individualism as

political and social philosophy that emphasizes the moral worth of the individual. Although the concept of an individual may seem straightforward, there are many ways of understanding it, both in theory and in practice. The term individualism itself, and its equivalents in other languages, dates—like socialism and other isms—from the 19th century.

Thus, the doctrine of individualism is the maximum freedom and opportunity for each individual to be able to develop himself in the direction he wants according to the personal capacity of each individual. Other terms that also refer to individualism are socialism and other isms, such as communism and other philosophies that developed in the 19th century.

Brooks (2021) suggests that experts have described individualism in three dimensions, namely: a belief in one's responsibility for one's actions; a belief in one's uniqueness; and a tendency to set and strive for one's personal goals. As with different people, some are more individualistic than others. The level of individualism of each country also varies according to their respective cultures.

The influence of individualism on the ideology of mathematics education can be seen in Ernest's book. Ernest (1991) says, "ideologies are understood here to be competing for belief systems, combining both epistemological and moral value positions, with no pejorative meaning intended". That is, the different ideologies are understood here as competing belief systems that combine epistemological and moral value positions, without the intention of degrading other belief systems. The belief system competition occurred because of the many ideologies that developed in the West in the spirit of individualism. Therefore, to determine the ideology of mathematics education from an individualistic society such as in England, Ernest (1991) tries to carry out systematic analysis and critical assessment of this central and fundamental problem so that the existing differences of all individual and group belief systems in British society can be accommodated into an ideological model of mathematics education that is relevant to them.

The ideological model of mathematics education proposed by Ernest (1991) as a result of his analysis is as follows.

Table 1 The Ideological Model of Mathematics Education proposed by Ernest (1991)

Primary Elements	Epistemology
	Philosophy of Mathematics
	Set of Moral Values
	Theory of the Child
	Theory of Society
	Educational Aims
Secondary Elements	Aims of Mathematics Education
	Theory of School Mathematical Knowledge
	Theory of Learning Mathematics
	Theory of Teaching Mathematics
	Theory of Assessment of Mathematics Learning
	Theory of Resources for Mathematics Education
	Theory of Mathematical Ability
	Theory of Social Diversity in Mathematics Education

Regarding this ideological model, Ernest (1991) says,

The model of educational ideologies proposed here reflects this degree of complexity. At the heart are situated the fundamental epistemological and ethical beliefs. Resting on these are the second set of beliefs concerning the aims of mathematics education and the means of attaining them. Thus the proposed model has two levels: (1) the primary level comprising the deeper elements of the ideology; and (2) the secondary level, made up of the derived elements on education.

From the quote above, we underline "At the heart are situated the fundamental epistemological and ethical beliefs". That is, "the point is the adjustment of fundamental epistemological and ethical beliefs to the situation of society." Of course, the fundamental epistemological and ethical beliefs with the social situation referred to here are in Western society, especially England, where epistemology and ethics are independent of religiosity so that the primary and secondary elements in the above model are also independent of religiosity. Therefore, the ideological model of mathematics education proposed by Ernest (1991) is a comparison material for the design of the ideological model of Indonesian mathematics education. The ideological model is of course not to be adopted. This is because the philosophy of Indonesian society is different from the philosophy of Western society, especially England.

As an illustration of the philosophy of life of British society today, we can look at research reports several years ago. Stone (2017) reports a finding of individualism from a social perspective, both in the UK and in several other European countries. The results of a survey of political attitudes towards all countries that are members of the European Union show that the UK occupies the position as the country with the highest individualistic level, while the European country with the lowest individualistic level is Greece. In addition, Brooks (2021) also reports that in a multi-national study using a measure commonly used as a reference in academic research, the results show that the United States and the United Kingdom have the most individualistic cultures followed by Australia, the Netherlands, and Canada. The countries with the lowest individualistic values are Venezuela, Colombia, Pakistan, and Indonesia.

The interesting thing is that it turns out that the majority of British people expect solidarity in social life. Stone (2017) also reports that although British society is at the highest individualistic level compared to other Western countries 52% of them hope that in the future their social life should be built on a foundation of solidarity, not individualism. Only 9% of them expect their society to be built on both individualism and solidarity. This means that in the future, the West, especially England, has great potential to come out of the philosophy of individualism that they have adhered to so far in their society.

The development of individualism in England to become as stated above, is not without cause. The development of this understanding is caused by the influence of perspectives on individuals, countries, and society by various streams. Several theories that influence this perspective are Darwin's theory of evolution, natural law theory about natural rights, the utilitarian theory about the greatest happiness for the most people, the classical economic theory about the free market and free fight liberalism, and Protestant Christian doctrine. that a person gets according to the will of his conscience (Fuady, 2010).

Meanwhile, in terms of religiosity, Lukes (2021) stated,

In England, individualism encompassed religious nonconformity (i.e., nonconformity with the Church of England) and economic liberalism in its various versions, including both laissez-faire and moderate state interventionist approaches.

From this passage, it can be seen that in addition to the doctrine of freedom and the widest opportunity given to every individual to develop themselves in England, there is also another doctrine of individualism, namely the incompatibility of society with religion, especially the church of England (religious nonconformity). Philosophers at this time deny the existence of God. They do not believe in religion and think that religion is just an understanding to deceive the human mind. They consider religion only poison for society (Ibrahim 2012).

Zarkasyi (2012) showed a report from the Ipsos MORI poll in November 2016 which showed that 36% of the British population adhered to humanism in terms of morality. Adherents of this philosophy cult of reason and call themselves morality without religion. The more moral or humane a person is the more atheist (Zarkasyi 2012). That is why, continued Zarkasyi (2012: 50), why in England people consult more with The British Humanist Association than with the Pastor in the Church. Previously, the 2001 census in the UK showed at least 15.5% of the population had no religion. Then, a 2004 UK Home Office survey found 22% of the population did not believe in religion. Another survey shows 30% - 40% of the UK population claim to be atheists and agnostics, of which 65% of those who profess to be atheists and agnostics are youth.

The manifestation of incompatibility with religion in the Western doctrine of individualism can also be seen, for example, from the words of Bakunin (1970). On the front page of his book, "God and the State", Bakunin (1970) asserts that "If God existed it would be necessary to abolish him." According to Hidayat (2017), this kind of reaction in the West shows the hatred of the concept of God, let alone to be included in the state political system.

When compared with Indonesia, we see that the Indonesian nation is not an individualist nation, as Brooks (2021) reports, nor is it a nation that is not compatible with religion. Abbott (2017) reports,

Indonesia's collectivist culture originates from the influence of Hinduism (carrying out an obligation and duty through gotong royong), Islam (the tradition of musyawarah and mufakat), and the indigenous people groups (family and group-oriented for individual security, dependence on teachers' knowledge, and avoiding conflict for achieving harmony). The Abbott report (2017) above shows that the Indonesian nation is a collectivistic and theistic (religious) nation, where collectivist culture and religion are inseparable in the lives of the Indonesian people. The religiosity of the Indonesian nation was recognized by the founders of the Indonesian nation itself (Hidayat, 2017). The religiosity of the Indonesian nation is manifested in the notion of God Almighty. The notion of God Almighty is a basic and primary view that substantially animates the entire state of the Indonesian nation (People's Consultative Assembly of the Republic of Indonesia 2012).

The following is the view of the founders of the Indonesian nation regarding the meaning of God Almighty.

First, the formulator of the Preamble to the 1945 Constitution contains the current Pancasila text in the BPUPK in 1945. One of the characters is H. Agus Salim who wrote about the meaning of Belief in One God, "... I remember very well that at that time none of us was an even those who doubt that by the basic principle of Belief in the One Supreme God is meant 'aqidah, religious belief, with the strength of belief that the independence of the nation and homeland is a right that is obtained from the grace of God Almighty ... I and the Muslims who follow the religion of Allah in the Qur'an as taught by the Prophet Muhammad depending on the obligation to continue to carry out the call to God Almighty with wisdom with a gentle but firm warning so that hopefully the work of mankind can be arranged and regulated ..." (Husaini 2016)

Second, the PPKI council involved Islamic figures, August 18, 1945. The PPKI council involved two Islamic figures, namely Ki Bagus Hadikusumo and Mr. Teuku Mohammad Hasan. They both interpret the belief in God Almighty as monotheism (Husaini 2016). Mohammad Hatta, who actively lobbied the two of them to be willing to remove the "seven words" (with the obligation to carry out Islamic law for its adherents) from the first precept and replace it with "The Almighty" emphasized that the notion of "Belief in One Supreme God" is indeed monotheism in Islamic teachings. (Husaini 2009).

Third, the proclaimer figures on August 17, 1945. The proclaimers were Soekarno and Hatta. Hakiem (2018) quotes Soekarno's words, "Divinity (religieusiteit), it has lived in the hearts of the Indonesian people for decades, hundreds, and thousands of years. I dug into the earth of the Indonesian people, and the first thing I saw was divinity (Religieusiteit)". Aning (2019) states the same thing as Hakiem (2018). Meanwhile, Mohammad Hatta said, "The One Godhead is the basis that guides our state's ideals to carry out all that is good, while the humanitarian basis is a continuation in the actions and practices of life rather than the principles that led earlier. And the basis of God Almighty is not only the basis of respect for each other's religion, but also the basis that leads to the path of truth, justice, goodness, and honesty".

Fourth, the constituent figures. Two of the constituent figures, namely Mohammad Nasir and Arnold Mononutu. In one of his speeches, Mohammad Nasir, who is a Muslim figure, said, "… Indonesia does not separate religion from state (issues). Indonesia firmly declares that belief in God Almighty is the first pillar of Pancasila, the fifth principle, which is adopted as the spiritual basis, moral, and ethical basis by the Indonesian state and nation." Meanwhile, Arnold Mononutu, who is a Christian figure, said, "Belief in the One and Only God is for us, the principal and source of other precepts. Without God Almighty, Pancasila would be a mere materialistic philosophy." (Hakiem 2018)

Regarding the meaning of the Precept of the One Godhead which may be interpreted in various ways by various religions and ideologies, Husaini (2009) asserts,

Sebenarnya terlepas dari agama dan ideologi masing-masing, harusnya bangsa Indonesia mau bersikap jujur bahwa rumusan Pancasila yang berlaku sekarang ini, tidaklah terpisahkan dari rumusan Pembukaan UUD 1945 yang kini berlaku kembali sebagai hasil Dekrit Presiden 5 Juli 1959. Karena itu, dalam memahami sila pertama, misalnya, tidak boleh dilepaskan dari alinea ketiga Pembukaan UUD 1945: 'Atas berkat rahmat Allah Yang Maha Kuasa …'. Jadi, sila pertama, menurut berbagai tokoh organisasi Islam bisa dikatakan sebagai penegasan konsep tauhid dalam Islam, sebab dalam alinea ketiga jelas-jelas disebutkan nama Tuhan yang Esa, yaitu Allah.

[Actually, regardless of their respective religions and ideologies, the Indonesian people should be honest that the current formulation of Pancasila is inseparable from the formulation of the Preamble to the 1945 Constitution which is now valid again as a result of the Presidential Decree 5 July 1959. Therefore, in understanding the first precepts, for example, cannot be separated from the third paragraph of the Preamble to the 1945 Constitution: 'By the grace of Allah the Almighty…'. So, the first precept, according to various figures of Islamic organizations, can be said to be an affirmation of the concept of monotheism in Islam, because in the third paragraph, it is clear that the name of the One God, namely Allah is mentioned].

The description above shows that the founders of the Indonesian nation with the idea of Pancasila as the nation's ideology were well aware that Indonesian society was a very religious society, not an atheist society like people in Britain and Europe in general, where there was the rejection of religion. Thus, the reports of Abbott (2017), Stone (2017), Hidayat (2017), and Brooks (2021) further strengthen that Pancasila as the philosophy of the Indonesian nation is not in line with the individualism that underlies the construction of the ideological model of mathematics education proposed by Ernest.

What the British people dream of today seems to be the value of solidarity that exists in Pancasila as described by Abbott (2017). Therefore, it is an irony that the Indonesian people tend to imitate the Western Individualistic culture to leave the collectivistic culture, cooperation. Moreover, when campaigning for their individualistic culture in Indonesian society. Westerners themselves have shown a desire to get out of individualistic culture and dream of solidarity, togetherness, and collectivism, or in our terms gotong royong in their social life. Not only that, the Indonesian nation is a religious nation that is very compatible with religion, where Indonesian culture is even influenced by religious teachings (Abbott 2017) and this is contrary to the doctrine of the individualism which hates and rejects religious intervention in their social life.

1.1 Controversial Issues in the Philosophy of Mathematics Education Textbook by Paul Ernest

The controversial issue referred to here is an issue that is debated among philosophers and mathematicians in Ernest's book. In this book, there are at least two main controversial issues. First, in the first part of this book, which is about whether mathematics is certain and absolute knowledge or not. Second, in the second part of this book, namely whether mathematical knowledge is value-laden or value-free.

1.1.1 Is mathematics a certain knowledge or not?

Another language of this issue is whether mathematical truth is absolute or not? This issue is between absolutist and fallibilist mathematics. Absolute mathematics views mathematics as knowledge that is certain and true. On the other hand, there are mathematical fallibilists who view mathematics as the knowledge that can be wrong and needs revision. In the Introduction section of his book, Ernest says,

The first part of the book treats the philosophy of mathematics. It contains both a critique of existing approaches and a new philosophy of mathematics. For although the traditional paradigm is under attack, the novel and promising ideas in the Zeitgeist have

not yet been synthesized. Social constructivism is offered to fill this vacuum.

It can be said that these two issues, mathematical absolutism, and fallibilism, are presented in the first part of Ernest's book throughout Chapters 1 and 2 of Ernest's book, starting from a critique of the philosophy of absolutism (Chapter 1) and the reconceptualization of the philosophy of mathematics, because of the fundamental problems in the philosophy of mathematics. mathematical truth (Chapter 2) until finally, social constructivism (Chapter 3) is present as an alternative offered to the confusion that exists in mathematical truth and fills the vacuum of the situation. Meanwhile, Chapter 4 (Social Constructivism and Subjective Knowledge) and Chapter 5 (Parallel Social Constructivism) are developments from Chapter 3 (Social Constructivism).

In Ernest's view, the high spirit of rejection of absolutism should be responded to wisely, without viewing mathematics as the knowledge that is no longer valuable, because it was banished from the garden of heaven or banished from the realm of certainty and truth that had been embraced even since classical Greek times. This is because, according to him, although the certainty of mathematical knowledge is lost, it does not mean that mathematical knowledge is also lost.

Ernest analogizes what is happening today to mathematical truths with what has happened to physical truths. The development of modern physics through the release of an absolute universal frame of reference and supporting a relativistic perspective is required by the General Theory of Relativity. It does not lead to a loss of knowledge about absolute frameworks and certainty, but on the contrary, we see that Relativity and Uncertainty in physics represent a major advance in science.

According to Ernest, what is happening in the field of physics is the same as what is happening in the field of mathematics today. When our mathematical knowledge is more established and we learn a lot about the mathematical knowledge base, we finally realize that the view of absolutism is just an idealization or in other terms is just a myth. This view is an advance in knowledge, not a retreat from the certainty that once existed in the past.

Thus, is mathematics a definite knowledge or not? For us, the answer to this question can be given epistemologically according to the West and Pancasila.

First, in Western epistemology, the dominant perspective is that mathematical truth is not absolute. Ernest's argument is logical enough for us to state that mathematical knowledge is uncertain and not absolute truth. Soedjadi's (2000) suggestion which calls the truth of mathematics the truth of consistency is very logical and is in line with the spirit of fallibilism for the advancement of knowledge. With the truth of consistency, the truth of mathematics is interpreted as the extent to which mathematics can maintain the consistency that exists in its system. If at any time there is an error in the mathematical system, such as the one discovered by Bertrand Russell which became known as Russell's Paradox, then the error is still open to revision.

Second, the manifestation of the first principle of Pancasila, "Belief in One Supreme God", especially Islamic epistemology, where mathematical truth is not absolute. Mathematics and religion are closely related. However, unlike Pythagoras' view of the relationship between mathematics and religion, "religion is mathematics – mathematics is religion" (Hersh 1997). Pythagoras viewed mathematics and religion as one because religion is mathematics, mathematics is religion. However, mathematics is not a revelation of the scriptures, like the Qur'an and as-Sunnah. When viewed from the source, the primal elements and postulates in mathematics still originate from humans. The primal elements and postulates are formulated through a process that relies on human thought itself through a search that is essentially speculative and arbitrary. Substantially, mathematics is a human sentence. Thus, the truth of the postulate is relative (Tiro 2005).

Pancasila is the basis of the state desired by all Indonesian people (Kansil 1996). The first precept of Pancasila, "Belief in One God" is the precept that animates the other four precepts. Re-interpreting Pancasila means that we want to reaffirm our commitment that the values of Pancasila are the basis and ideology in our society, nation, and state. The values of Pancasila must be the basis of ethics and morals when we build political institutions, government, economics, law formation and enforcement, politics, socio-culture, and various other aspects of life (People's Consultative Assembly of the Republic of Indonesia 2012).

Educators who teach with a philosophical view will understand the value and dignity of the teaching and learning activities they face, and take the initiative to encourage the creation of conditions, in which their students can develop according to expectations (Bakhurst 2020). In the Indonesian context, students who have been taught with a philosophical view are expected to have a philosophical view that is in line with Pancasila.

1.1.2 Is mathematical knowledge value-laden or value-free?

Etymologically, value-free means not altered or influenced by value judgments (Collins 2021). Value-free can be interpreted as not being changed or not influenced by value judgment. In terminology, the meaning of value-free can be seen from Poincare's words as seen by Lacey (1999),

Ethics and science have their domains, which touch but do not interpenetrate. The one shows us what goal we should aspire to, the other, given the goal, teaches us how to attain it. So they never conflict since they never meet. There can be no more immoral science than there can be scientific morals.

Poincare's words show that ethics and science really must be separated and must not influence each other. By saying, "There can be no more immoral science than there can be scientific morals" or "No science is more immoral than scientific morals", Poincare wants to state that the most immoral science is the science that is influenced by morals. Because value-free in science has also been considered a value or in Lacey's (1999) terms, "science is value-free" has been held as a value. On the other hand, according to McCain & Kampourakis (2020), science is full of value. Brown

(2020) firmly stated, "Science is necessarily value-laden, and scientists must make value judgments to do science responsibly, with integrity". It means, "Science is, of course, full of values, and scientists must make value judgments to conduct science responsibly with integrity". It is a fact that there is a controversy surrounding science regarding values, whether science is value-free or value-laden.

In addition to the conflicting value issue among scientists, in Ernest's (1991) book, there is also a contradiction among mathematicians about whether mathematics is value-free or value-laden. Regarding value-free philosophers and mathematicians, Ernest (1991) says,

Absolutist philosophies are committed to a belief in the absolute objectivity and neutrality of mathematics, as are a range of personal philosophies of mathematics. However, despite this belief, the view of mathematics they promote is itself value-laden. For, as we have seen, within mathematics there are implicit values. The abstract is valued over concrete, formal over informal, objective over subjective, justification over discovery, rationality over intuition, reason over emotion, general over particular, theory over practice, the work of the brain over the work of the hand, and so on. These constitute many of the overt values of mathematicians, as well as being shared by much of British and Western scientific culture.

Adherents of mathematical absolutism believe that mathematics is neutral and objective or value-free. From here, we can also see the scientific value held by mathematicians in England and the West. When mathematicians assume that abstract value is higher than concrete, formal value is higher than informal, objective value is higher than subjective, justification value is higher than discovery, rationality value is higher than intuition, ratio value is higher than emotion, general value is higher than specified, the value of a theory is higher than practice, the value of brainwork is higher than hand labor, and so on, so actually mathematicians also have their egos over scientists. The assumption that mathematicians place the work of mathematicians above the work of scientists seems to be a manifestation of "mathematics is the queen of the sciences" which was once put forward by Carl Friedrich Gauss.

Ernest (1991) expressed his views regarding the values believed by mathematical absolutists,

What I wish to claim is that the values of the absolutists are smuggled into mathematics, either consciously or unconsciously, through the definition of the field. In other words, all that the absolutist perspectives will admit as bona fide mathematical knowledge must satisfy these values, and that anything that does not is rejected as inadmissible. Mathematical propositions and their proofs, the products of formal mathematical discourse, are admitted as legitimate mathematics. The mathematical invention, the practices of mathematicians, and other products and processes of informal and professional mathematical discourse are not.

Once the rules of demarcation of the discipline are established in this way, then it can legitimately be claimed that mathematics is neutral and value-free. For in-place of values, there are rules which determine what is admissible. Preferences, choices, social implications, and all other expressions of values are eliminated by explicit and objective rules. The values lie behind the choice of the rules, making them virtually unchallengeable. By legitimating only the formal level of discourse as mathematics, it relegates the issue of values to a realm that is definitionally outside of mathematics.

If this criticism is accepted, at the heart of the absolutist neutral view of mathematics is a set of values and a cultural perspective, as well as an ideology that renders them invisible.

If we look at Lacey's (1999) quote on Poincare's words, "Ethics and science have their domains, which touch but do not interpenetrate" or "Ethics and science have their domains. The two touch, but do not affect each other", it can be said that the value condition for science is identical to the value condition for mathematics. The absolutist neutral view of mathematics can be like that, according to Ernest (1991), because their views are influenced by Western cultural values and perspectives, as well as the Western ideology they profess. This means that the position of values and cultural perspectives, as well as ideology, is very critical in viewing mathematics. Therefore, through the proposed social constructivism, Ernest (1991) says that mathematics is not value-free, but value-laden,

Social constructivism views mathematics as the product of organized human activity, over time. All the different fields of knowledge are the creations of human beings, interconnected by their shared origins and history. Consequently, mathematics like the rest of knowledge is culture-bound and imbued with the values of its makers and their cultural contexts.

For mathematics education, there are profound consequences for the view that mathematics is value-free. Ernest (1991) suggests,

there is the premise that mathematics is neutral. … if this premise were to be granted, there is the hidden assumption that mathematics teaching is also neutral, and cannot compensate for the nature of mathematics. In contrast, I have argued that all teaching is intrinsically value-laden and can be made to serve egalitarian (or other) principles.

A major consequence of the view that mathematics is value-free is the hidden assumption that mathematics teaching is also neutral. Ernest (1991) refuted this hidden assumption. According to him, all teaching, including mathematics teaching, is intrinsically value-laden and can be implemented, both with egalitarian principles and with other principles.

Based on the opinion of Ernest (1991) who opened up space to accommodate other principles, it can be said that the five principles of the Indonesian nation, namely Pancasila, for the Indonesian context can become principles in teaching mathematics in Indonesia. This also confirms the views of Swadener and Soedjadi (1988), "Panca Sila is the foundation of national values and morality." That is, "Pancasila is the foundation of the nation's values and morality". They also said, “Most nations, either formally or informally, adhere to a definite system of values.

Indonesia is a good example. Indonesia was founded on the five principles of Pancasila." It means "Most nations, both formally and informally, adhere to certain value systems. Indonesia is a good example. Indonesia was founded on the five principles of Pancasila." This shows that the foundation of the philosophy of education, including mathematics education in Indonesia, is Pancasila.

With Pancasila as the foundation of values, Western views, including the social constructivism proposed by Paul Ernest, need to be viewed critically. Although constructivism has a positive side according to experts, because of its emphasis on active student participation and social learning, it turns out that constructivism also has a negative side (Liu and Matthews 2005). Suparno (1997) said,

> ... Dalam pengunaan prinsip konstruktivisme, terlebih dalam pendidikan sains dan matematika, memang ada bahaya jatuh ke empirisme bila orang terlalu menekankan pentingnya pengalaman dan eksperimen dalam pembentukan pengetahuan ... Bagi yang terlalu menekankan segi abstraksi pengetahuan, mereka dapat cenderung menjadi subjektivisme.
>
> Menurut konstruktivisme, pengetahuan selalu punya sifat subjektif karena dibentuk oleh pengamat. Dalam kaitan ini, sebenarnya pengetahuan seseorang itu tidak pernah "salah" karena subjektif. Bahkan kaum konstruktivis radikal harus menerima setiap abstraksi dari seseorang. Mereka tidak mempunyai cara untuk menilai apakah abstraksi seseorang itu salah atau tidak ...
>
> [... In applying the principles of constructivism, especially in science and mathematics education, there is a danger of falling into empiricism if people overemphasize the importance of experience and experimentation in the formation of knowledge ... For those who overemphasize the abstraction of knowledge, they can tend to become subjectivism.
>
> According to constructivism, knowledge is always subjective because it is formed by observers. In this regard, one's knowledge is never "wrong" because it is subjective. Even radical constructivists have to accept every abstraction from someone. They have no way of judging whether someone's abstraction is wrong or not...]

Constructivism which emphasizes the abstraction of knowledge which is emphasized in mathematics and learning according to Suparno (1997) can lead students to subjectivism. As a result, knowledge is considered to always have a subjective nature, because it is formed by those who observe it so that one's knowledge is never wrong.

Liu and Matthews (2005) say, "These claims are suspected to lead to epistemological relativism, where there exists no absolute truth and any truth is as good as other." Phillips (1995) himself emphatically states the evils of constructivism, because of "the tendency within many forms of constructivist epistemology ... towards relativism". Another bad, according to Phillips (1995), is "the quasi-religious or ideological aspects of constructivism". We are in line with Liu and Matthews (2005) and Phillips (1995).

When viewed from Pancasila, in particular, the precepts of the One Godhead, relativism, and quasi-religious and quasi-ideological aspects are fatally wrong. Because Pancasila views religion and ideology as true, not quasi. Religion and Pancasila recognize the absolute truth that contradicts the idea of constructivism. Thus, it can be said that constructivism as a philosophical thought in learning, especially mathematics learning is rejected, but constructivism in learning activities is still accepted because constructivism in learning encourages students to actively form their knowledge and develop their social skills.

One form of naivety in the use of relativism in social life is the assessment of religious behavior. It should be noted that this judgment is unavoidable, and surely it is secretly carried out by all religious adherents. The assessment of the behavior of adherents of other religions is certain and must be judged by the laws of their religion. For example, the Qur'an equips a Muslim prime element to think and judge human behavior based on the evidence, "They do blaspheme who say: Allah is one of three in a Trinity: for there is no god except One Allah." (Quran Chapter al-Maa'eedah verse 73). This verse requires a Muslim to evaluate the religious behavior of others. However, a Muslim should not force that assessment to apply, because of the rules *"*Let there be no compulsion in religion, Truth stands out clear from Error.*"* (Qur'an Chapter al-Baqarah verse 256). It is enough for a Muslim to uphold the principles "To you be your Way, and to me mine." (Qur'an Chapter al-Kafiroon verse 6). Thus, tolerance for inter-religious life will be created, even without relativism and constructivism.

From the description above, it appears that both social constructivism and Pancasila are full of values. However, the value-laden approach to mathematics based on Pancasila is different from the value-laden one based on social constructivism. The state of society, the culture of Western society are different from that of Indonesian society (Tilaar 2012). The values in Pancasila are based on the religious spirit of God Almighty. The more religious a person is, the more human he will be (Zarkasyi 2012). While values in social constructivism are based on the spirit of humanism or anthropocentrism. The more human a person is, the more atheist he will be (Zarkasyi 2012). That's because humanism views that life is not centered on God, but humans (Kuntowijoyo 2006). That's because atheism that is being developed today, not only does not recognize the existence of God but also removes the role of God which is considered a barrier to freedom and enjoyment of human life (Husaini 2010).

4. CONCLUDING REMARKS

4.1 Conclusions

Based on the results of the research and discussion in the description above, it can be concluded that in writing his book, Ernest used the Higginson approach, where mathematics education is psycho-philo-socio-mathematics. The philosophy of mathematics education in Ernest's book suggests that mathematics be studied in a meaningful and relevant life context for students. This includes learning mathematics in the context of their language, culture, and everyday life, as well as their school-based experiences. This view of mathematics is logical and opens up space for a multicultural approach to mathematics. This is because, as a whole, mathematics is responsible for its uses and consequences, both in the field of education, as well as in the social field. Thus, the view of mathematics will also become more humane or humane. A humanist approach in education, including mathematics education, will strengthen students.

However, the results of the study show that the ideology of mathematics education that he put forward in this book is not in line with Pancasila as the identity of the Indonesian nation as well as the ideology of mathematics education in Indonesia. The most critical thing that needs to be removed in this book is the atheistic individualistic philosophy that underlies Ernest's mathematics education ideology if it is to be applied in the Indonesian context. This philosophy is not in line with the theistic collectivistic Pancasila.

There are at least two controversial views on mathematics in the West that are raised in the book. First, the issue of mathematical knowledge, whether it is value-free or value-laden. Although this book adheres to the view that mathematics is full of value, in the West this is still a matter of debate. Meanwhile, in Indonesia, with the ideology of Pancasila, knowledge of mathematics, as well as its teaching, it is final that it is full of cultural values that are influenced by theistic. Second, the issue of whether mathematical knowledge is definite with absolute truth or not. In the Indonesian context, the manifestation of the first principle of Pancasila, "Belief in One Supreme God", the truth of mathematics is relative or not absolute, because, in substance, mathematics is not a revelation, but a human sentence formulated through a process that relies on human thought itself which is essentially human. started speculatively and arbitrarily.

4.2 Recommendations

Based on the conclusions of the research above, it is recommended as follows. Filtering foreign cultures needs to be done to maintain the personality of the Indonesian nation (Al Munir 2013). Thus, textbooks on the Philosophy of Mathematics Education in Indonesia should be in line with the Pancasila ideology or built on the foundation of the Pancasila ideology. The filtering of foreign cultures is an intermediate attitude towards the West. Indonesia with a Muslim majority population is not anti-Western, but not inferior to the West (Zarkasyi 2012). The manifestation of the filtering of foreign cultures in Paul Ernest's Textbook of Philosophy of Mathematics Education for the Indonesian context can be based on two of the three principles put forward by, the Father of Indonesian National Education, Ki Hajar Dewantara (Tilaar 2012). First, the principle of convergence. That is, choosing good elements from outside culture to be integrated with the original one. With this principle in mind, the Philosophy of Mathematics Education textbook is written in the form of a critical review of Paul Ernest's book of Philosophy of Mathematics Education based on the ideology of Pancasila. Second, the principle of concentric. That is, culture continues to change, but still maintains its property. With this principle, the textbook on Philosophy of Mathematics Education is written based on the ideology of Pancasila only. However, for now, in our opinion, the first principle is easier to implement than the second principle.

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