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Humanism Learning Theory and Mathematics Learning

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Abstract
This was a library research which aimed at revealing the nature of the philosophy of humanism to become a learning theory in education and finally to our world of mathematics education in Indonesia, acquiring expert criticisms of humanism, and describing briefly the application of humanism as a learning theory in mathematics education. The research result shows that humanism is one of the atheist philosophies. In 1962, it began to influence psychology, education, and the workplace. Maslow's Theory of Needs, then had a significant effect on education, especially in the development of learning theories, including mathematics education. This theory has also drawn criticism. Some experts think that this theory is not based on rigorous scientific experience. Meanwhile, other experts review the philosophy that underlies this theory from the context of values, religion, culture and ideology of the Indonesian nation. However, the learning theory built on the philosophy of humanism can also be applied in mathematics education. A good example of this is the differentiation of mathematics learning. Through this, all students learn in different ways and according to their level of difficulty in understanding mathematical concepts. In other words, each student gets treatment according to his or her needs.
Keywords: Humanism; Learning theory; Mathematics learning

INTRODUCTION

It is recognized that mathematics is an important tool in the rapid development of science, high technology and commerce in today's world (Skemp, 1987). Nevertheless, mathematics is a science that has many faces. This can be seen from the words of several experts.

Khait (2005) states, "Mathematics is an essentially linguistic activity characterized by association of words with precise meanings". In addition, Skemp (1987) views mathematics as a powerful tool that focuses on the functioning and the fruit of human intelligence,as well as how to use our minds to increase their power. Further, according to Johnson & Rising (1967), mathematics is basically concerned with ideas, processes, and reasoning. Thus, according to them, mathematics is much more than arithmetic (the science of numbers and computation); more than algebra (a language of symbols and relations); more than just geometry (the study of form, measure, and space).

The facial differences displayed by mathematicians when describing the meaning of mathematics show that they actually do not have agreement (Johnson & Rising, 1967; Hudojo, 1990; Soedjadi, 2000). Although there is no consensus among mathematicians about what mathematics is, we can state that mathematics is a creation of the human mind (Johnson & Rising, 1967). As for Soedjadi (2000) himself, the different definitions, if explored, will actually show certain characteristics that can summarize the definition of mathematics in general, namely having abstract objects, relying on agreement, having a

deductive mindset, having symbols that are empty of meaning, paying attention to the universal set, and being consistent in the system.

These characteristics of mathematics require that mathematics education be well organized. The standard of goodness here is when mathematics education is organized on the basis of the relevant theory. The importance of this theory is implied by Ernest (2018) through his explanation of the purpose of the philosophy of mathematics education, where one of the criticisms of the philosophy of mathematics education is the claim to practice mathematics education. Practice here means the implementation of real mathematics education in accordance with what is stated in theory.

Ernest's criticism (2018) demands an educator to have a philosophical view in teaching mathematics. It means that when an educator teaches mathematics, an educator must ensure that he or she teaches mathematics based on a certain learning theory. In other words, a mathematics educator should not be careless in teaching mathematics. This is because the achievement of mathematics learning objectives, both material goals and formal goals, should be done by design, rather than by chance (Soedjadi, 2000).

There are several learning theories that are relevant to learning mathematics. Let say, for example, learning theories of behaviorism, cognitivism, constructivism, and humanism, as well as social learning theory. However, in this paper, the discussion is limited to humanism learning theory in mathematics learning. The specification of the discussion on the theory of humanism is expected to provide a picture of this theory and the application in mathematics learning.

Based on the description above, the problems in the study of this article and the purpose of writing are formulated. There are at least three problem formulations in this paper. First, how did the philosophy of humanism actually become a learning theory in education and finally to our world of education (mathematics) in Indonesia? Second, what are the expert criticisms of humanism? Third, what is an example of the application of humanism as a learning theory in mathematics education? Thus, the purpose of writing this article is also at least three. First is to reveal the nature of the philosophy of humanism to become a learning theory in education and finally to our world of education (mathematics) in Indonesia. Second is to acquire expert criticisms of humanism. Third is to describe briefly the application of humanism as a learning theory in mathematics education.

METHODS

This was a library research with qualitative approach. The data sources in this research were secondary. Elmer E. Rasmuson Library (2020) stated that secondary sources are studies by other researchers. They describe, analyze, and/or evaluate information found in primary sources. By repackaging information, secondary sources make information more accessible. A few examples of secondary sources according to Elmer E. Rasmuson Library (2020) are books, journal and magazine articles, encyclopedias, dictionaries, handbooks, periodical indexes, and reviews, etc. Within this research, we referred to books, journals, encyclopedia, and dictionaries. This research was conducted through the following stages: defining the topic, writing a thesis or problem statement, making an outline, developing a search strategy, evaluating the sources, taking careful notes, writing and revising the paper, as well as documenting the sources.

RESULTS AND DISCUSSION

Etymologically, we can find the definition of humanism by referring to some dictionaries. Cambridge Dictionary (2021) defines humanist as, "a person who believes in humanism (the idea that people do not need a god or religion to satisfy their spiritual and emotional needs)." Meanwhile, Merriam-Webster (2021) states humanism as, "a doctrine, attitude, or way of life centered on human interests or values. Especially, (it is) a philosophy that usually rejects supernaturalism and stresses an individual's dignity and worth and capacity for self-realization through reason." From the meaning of humanism, it can be said that a humanist is a person who adheres to a doctrine, attitude or way of life that is centered on human interests or values. In a philosophical review, adherent of humanism are that of an understanding that usually rejects supernaturalism (divinity) and emphasizes the dignity, value and ability of individuals to have self-awareness by using their minds.

The results of this study indicate that from 218 students there are 22 students with low mathematical resilience categories, 156 students with moderate mathematical resilience categories and 40 students with high mathematical resilience categories. Most of the students are in the medium mathematical resilience category, and each high, medium and low category has different mathematical problem solving abilities in solving HOTS questions, namely (1) Low mathematical resilience indicates that undergraduate and postgraduate students have the same problem solving abilities students' mathematical problems in solving HOTS questions, namely students are able to meet the indicators of understanding the problem which means students understand the problem by showing the information contained in the problem. (2) On the mathematical resilience which is showing that S3 and S4 students do not have the same mathematical problem solving ability of students in solving HOTS questions, but has a difference, namely S3 students fulfill the indicators of carrying out the plan incorrectly or not writing the calculation method correctly, even though the answer student is correct. While S4 students fulfill the indicators of carrying out the plan by writing in detail the completion steps, but there are errors in calculations that make students' answers wrong. (3) High mathematical resilience shows that S5 and S6 students do not have the same mathematical problem-solving abilities in solving HOTS questions, but they have a difference, namely S5 students fulfill the indicators of planning by writing the formula to be used and the solutions they get lead to completion. appropriate, while S6 students meet the indicators of planning by designing solutions that lead to inappropriate solutions, and students do not write down the formula to be used.

It seems that Alastair Sharp's statement is in line with the etymological meaning. According to Alastair Sharp, what is generally accepted is that those who have a strong dogmatic belief in God cannot be termed humanists. This includes those who have strong dogmatic political beliefs (Seel, 2012). This is corroborated by the American Humanist Association (2021), according to this organization, "Humanism is a progressive philosophy of life that, without theism or other supernatural beliefs, affirms our ability and responsibility to lead ethical lives of personal fulfillment that aspires to the greater good". It means humanism is a progressive philosophy of life, without theism (understanding of divinity) or other supernatural beliefs, affirming our ability and responsibility to live an ethical life of fulfilling personal needs in order to provide greater benefit.

Modernism in philosophy brings a new face that is different from the middle ages. Modern thinkers from a country that is considered modern assess a way of thinking based on religion as backward thinking, primitive or ancient. It is because of the history of Medieval Europe. At that time, Europe was immersed in The Dark Ages caused by the interference of the church in public affairs. Religion and noble values, such as those known in Eastern culture are not a concern even they are considered as obstacles to progress, so they must be removed. The Western disillusionment with the church has made Western thinkers and philosophers 'rebellious' against the church. They then blamed religion. The mistake of Western thought is equalizing religious. The mistakes of the Roman Catholic church cannot be evenly distributed to all religious institutions, especially to Islam. Science and civilization actually advanced and developed under the Islamic caliphate, when the Qur'an and the Sunnah became the basis of thought. Thus, humans are the ones who misunderstood. Islam itself is not wrong. This is the fatal mistake of modern Western philosophers and thinkers (Agus, 2015).

The philosophy of this era is anthropocentrism. Rationalism is part of it. The rationalism that emerged in the 15th or 16th century rejected theocentrism. Human reason (mind) is exalted and God's revelation is despised. The source of truth is thought, not God's revelation. God is still acknowledged to exist, but God is paralyzed, has no power, and does not make laws. This condition is what characterizes the modern age. Here is humanism or anthropocentrism, where humans occupy the highest position. Humans are the center of truth, ethics, wisdom, and knowledge (Kuntowijoyo, 2007). Subsequently, Voltaire (1694–1778) often stood against injustice and sided with truth and the principle of freedom of expression, defending few religious beliefs. A number of figures who are considered humanists are David Hume (1711–76), Jeremy Bentham (1748–1832), Jean Jacque Rousseau (1712–1778), and Bertrand Russell (1872–1970) (Seel, 2012).

Seel (2012) reported that Alastair Sharp also pointed out that, in 2002, at the beginning of the 21st

century, a meeting of the International Humanist and Ethical Union was held. The meeting offered a "statement of beliefs" which is summarized as follows: Ethical obligation to care for all human beings; the obligation to use science rationally and creatively which is built on human values; commitment to provide freedom of education for all, without the burden of political or religious dogma; belief in personal freedom together with social responsibility; as well as belief in the value of art, music, visual and performing arts, and encouragement of creativity. If we look at the five points of the statement of beliefs about humanism, it seems that this belief has also reached our world of education today, including mathematics education.

The statement of beliefs about humanism above also strengthens Kurtz's statement that defining humanism is a problem. In the context of education, this has an impact on the difficulty of determining specifically whether a particular method or learning situation can be said to be humanistic. This is because humanism identifies non-directive learning methods to provide opportunities for a child to become truly independent. However, it is also not always clear whether these non-directive learning methods really make children independent. This is because of the risk of anarchy and the loss of fundamental values in learning (Seel, 2012).

The discussion in this section is taken from Seel (2012). We attempt to summarize the idea of humanism as a learning theory from his writing as follows.

Early thinkers in humanistic education were John Dewey (1859–1952), Paulo Freire (1921–1997), Johann Pestalozzi (1746–1827), and Maria Montessori (1870–1952). The idea of the educator whose last name is mentioned is still very popular. In children's education, the Montessori approach encourages children to develop creativity, follow their own interests, interact with others, and learn at their own pace. Despite periodic criticism, this approach has recently been praised by Stoll Lillard and has proven to be very useful, both in traditional subject areas, as well as in social and creative development.

According to Vaughan, the Summer hill A. S. Neill school opened in 1921 and is a well-known example of applying a humanistic approach to education. The school creates a democratic environment, where teachers and students have an equal voice in the decision-making process. There are no conditions for taking lessons and no religious lessons (although philosophy and history are taught). Students are given space to learn and develop. The basic premise is that if children learn about prejudice, hatred, and intolerance from adults in authority, they will naturally grow up to be caring and loving individuals.

Abraham H. Maslow, who is then considered the father of humanistic psychology, has had a significant influence on education, particularly on the development of learning theory. He is arguably one of the most influential psychologists of modern times. Early in his career, he was associated with and influenced by Alfred Adler, Erik Fromm, and Karen Horney, as well as Max Wertheimer, Kurt Koffka, and Freudian and Gestalt psychologists. In 1935, Maslow went to Columbia University to work with Edward L. Thorndike, a behaviorist who had a major influence on himself and on learning theory in general. In 1943, he was asked to present a paper at the Society for Research in Psychoanalysis and Psychosomatics in New York. This invitation led to the publication of his paper entitled "A Theory of Human Motivation." In this paper, Maslow outlines the origins of his theory of need motivation. It was here that he introduced Goldstein's concept of self-actualization. Maslow did not believe that behavior was influenced by the environment or the subconscious, but he believed that behavior was a consequence of human choices. He believed that people are inherently good, free to act, and have unlimited potential to learn, grow, and develop. Individuals have the freedom and responsibility to become what they are capable of being and, therefore, individuals are responsible for learning. People act to meet needs.

Maslow's theory explains that everyone is born with a set of basic needs: (1) physiological, (2) security, (3) belonging or love, (4) self-esteem, and (5) self-actualization. In this theory, he states that higher needs arise when lower needs are met. Humanists instill their core beliefs into education and learning (faiths as identified by The Humanist and Ethical Union above) by considering that basically learning should be centered on the student's personal learning experience and the needs of the student. In other words, when lower-level needs are met, the motivation to fulfill higher-level needs is active. Each level of need directs behavior to a level of need that has not been met or fulfilled. Maslow was at the forefront

of establishing a legitimate study of humanistic psychology, "The Third Force," as he called it. In 1962, The Association of Humanistic Psychology was founded and the humanistic movement began to influence psychology, education, and the workplace. According to Boeree, "Maslow was one of the pioneers in the movement to bring people back to psychology, and people back to personality!"

Knowles et al. explained that the terms humanism and learning are important to define, especially in the context of education. Humanism focuses on humans as creatures who are free to act and control their own goals in life. Humanism is centered on values, interests, abilities, needs, self-esteem, and dignity. This is a belief that humans have unlimited potential for growth and development and that humans have an inseparable goodness from themselves. Individuals have the ability to determine their own truth and lies through rational and empirical thinking. Until a state of self-actualization where a person will be able to fully utilize his or her talents and potential. Meanwhile, learning refers to acquiring new knowledge, behaviors, skills, and values through the process of studying, practicing, and/or experiencing. Learning is "the process by which behavior is changed, shaped, or controlled".

Maslow's humanistic learning theory encourages innovation and creativity. It is believed in this theory that everyone is responsible for their own learning as well as learning from those around them. This theory encourages students to be in a supportive and safe environment, so that they are comfortable asking questions and exploring new concepts and possibilities. Carl Rogers emphasizes student-centered and experiential learning. Therefore, the focus is on the teacher's ability to cultivate a strong self-concept in students and the ability to make personal decisions, as well as a strong belief in independent learning. Learning should be personalized and clearly relevant to students. Specific needs must be identified, and teachers should empathize with students as individuals and seek to understand the way, in which, they make sense of the world. Jerome Bruner has shown that if such personalized needs are ignored, not only will learning be unproductive, but anti-school value systems can develop among learners.

Overall, Maslow states that humanism is a holistic view of psychology and human learning. He emphasizes that the best learning occurs, when the whole person (cognitive, affective, and psychomotor) is involved. In other words, the best learning occurs when a teacher takes into account the totality of human experience and "the whole human situation with its transcendence, subconscious, self-awareness, and freedom". The humanist approach to learning supports positive emotions in students (motivation, empathy, and high self-esteem) and tries to help and avoid negative emotions (anger, anxiety, stress and depression).

Mathematics learning differentiation is closely related to Maslow's theory or hierarchy needs. It is even likely built upon the theory. Subsequently, the discussion in this section is taken from Frei (2007).

It was once thought that students were at the same grade level, shared the same lessons, and learned more or less the same way. This view is currently considered wrong. Students have different learning styles, come from different cultures, have different levels of language skills, experience different emotions, and have different interests. Since students differ in terms of academic readiness, it means that teachers should have realized that they should differentiate their treatment to better meet the needs of different students.

According to Pettig, differentiation has many types depending on the particular students and the involved teachers, the outcomes of these students, and the structure of the classroom environment. According to the National Research Council, differentiation includes what is taught, how it is taught, and the products students create to demonstrate what they have learned. These three categories are often referred to as content, process, and product. Teachers should differentiate content, processes, and products based on students' readiness, their learning styles, and their interests. If students have had a learning experience that matches the required prerequisite skills and knowledge, they will learn better. Creating tasks that allow students to complete assignments according to their preferred learning style will help them have a more meaningful learning experience. If a learning topic is able to burn students' enthusiasm, make them interested in learning mathematics, then they will be involved in learning and will remember well what they have learned. To create an effective mathematics learning activity, the teacher should differentiate the lessons. Not all students need to be involved in the exact same activities

at exactly the same time.

All students learn in different ways and with different difficulties in understanding mathematical concepts. Even the level of difficulty experienced by students varies. Based on the level of difficulty faced in learning mathematics, students can be classified into certain level, for example, Level I, II, and III. Teachers who differentiate learning need to take sufficient time to plan and prepare well for learning and learning activities; provide assessments to students and use the results of these assessments to design learning strategies and provide appropriate interventions, if necessary; create specific plans to meet the needs of different students and communicate those plans well to parents; use many possible grouping strategies during learning activities in class; vary the types of activities and instructional forms used in the classroom to meet the learning needs of all students; continuously reflect on personal teaching strategies and modify mathematics instructional methods if students do not respond positively to delivery methods; and seek help from experts, other math teachers, parents, administrators, and anyone else who can help respond to student needs.

Susan R. Madsen & Ian K. Wilson (Seel, 2012) put forward a critique of humanism. They say that for decades Maslow has been criticized for building theory (Hierarchy of Needs) on clinical observations and observations of "self-actualized" friends and famous people. His theory is said not to be based on rigorous, scientific experiences, which he did not dispute. However, even with these limitations, his theory still remains popular as it is easy to describe and communicate. Yet, there remain more open questions than important scientific research around Maslow's work. Commenting on this theory, Madsen & Wilson say that this is not based on rigorous scientific experience which Maslow himself could not refute.

In addition, criticism of Western understanding in general is also expressed by Westerner himself namely Abbott (2017). He says, "Despite its active participation in transnational education, Indonesia maintains Pancasila, the 1945 Constitution (UUD 1945), and religion as the foundation of its education and to prevent the loss of Indonesian identity and cultural values". This means that even though Indonesia is actively involved in transnational education, Indonesia must still maintain Pancasila, the 1945 Constitution, and religion as the foundation in the implementation of its education and also to prevent the loss of Indonesian cultural values and identity. This is in line with Swadener & Soedjadi (1988) firmly saying, "Indonesian history and culture are significant factors in education and the education system plays an active role in promoting nationalism, values consistent with Indonesian national goals, and societal morality". This means that Indonesian culture and history are important factors in education. Meanwhile, the education system plays an active role in promoting nationalism, values that are consistent with Indonesia's national goals, and the nation's morality.

Furthermore, Tilaar (2012) also criticized Western theories used in education in Indonesia. He said that nowadays there are very few studies conducted on the educational process, so that many educational concepts are copies of educational concepts from the west. This is a fatal flaw because the state of society, the culture of western society is different from ours in Indonesia. Much local wisdom that is very useful in our society and culture are ignored and depend on research findings in western society. We do not know and take advantage of the noble moral traits of Indonesian society and culture which are the characteristics of individuals and the Indonesian nation, so we use learning methods in terms of character education by imitating what is implemented in western society. Character education or value education should be in accordance with the level of personal development of Indonesian children that have been studied and not based on the results of research on child development according to Piaget or Kohlberg or other western experts. Knowledge from the west certainly needs to be known and compared with the results of research on Indonesian children. Thus, we will obtain real forms of character education based on research on Indonesian children in Indonesian society and culture.

Kuntowijoyo (2007) also gave a criticism of humanism. His criticism is built on a religious foundation. According to him, there is a problem with humanism or anthropocentrism. This is because this view assumes that life is not centered on God, but on humans. Humans are the masters of reality. Therefore, it is man who determines his own destiny, not God. Humans are even considered as determinants of truth. This is the fatal mistake of humanism. In fact, even though religion claims to be the source of

truth, ethics, law, wisdom and knowledge, religion never makes God's revelation the only source of knowledge and forgets human intelligence, or on the contrary considers the human mind as the only source of knowledge and forgets God. So, there are two sources of knowledge, namely God and humans, or Theoanthropocentrism.

If self-actualization according to Maslow is without God, precisely in the view of Islam, according to Kuntowijoyo (2007) human self-actualization can only be realized perfectly in devotion to its Creator. Human self-actualization to achieve progress and glory, according to the Qur'an, is to always clean oneself. Self-cleaning can be manifested through patience and gratitude. In this way, the material progress achieved will not make a person restless, worried, alienated, or discouraged. This is because the ideals of the Qur'an regarding human progress are actually spiritual in nature, namely to achieve the pleasure of Allah. Whatever our efforts in the world must always be associated with the task of being the vicegerent of Allah, the representative of God on earth, to rule and regulate the world in accordance with His will.

CONCLUSIONS AND SUGGESTIONS

Humanism is also known as anthropocentrism. Humanism is an understanding that makes humans the center of truth that upholds the dignity, values, and abilities of humans as individuals so that they have self-awareness by using their minds and with a spirit of rejection of theism or supernaturalism. In short, humanism is actually an atheist philosophy. This thought became legitimate with the establishment of The Association of Humanistic Psychology in 1962. At that time, the humanistic movement began to influence psychology, education, and the workplace more broadly. Maslow's Theory of Needs then had a significant effect on education. In general, Maslow stated that humanism is a holistic view of psychology and human learning. He emphasized that the best learning occurs, when the whole person (cognitive, affective, and psychomotor) is involved, taking into account the totality of human experience and "the whole human situation with its transcendence, subconscious, self-awareness, and freedom."

Humanism from philosophy to learning theory has also drawn criticism from various parties regarding its existence in the Indonesian context. Swadener & Soedjadi stated that Indonesian culture and history are important factors in education. The education system plays an active role in promoting nationalism, values that are consistent with Indonesia's national goals, and the nation's morality. Further, Tilaar stated that the concepts of education in Indonesia are a lot of copies of the concepts of education from the west. This is a fatal flaw because the state of society, the culture of Western society is different from ours in Indonesia. Much local wisdom that is very useful in our society and culture are ignored and depend on research findings in western society. Furthermore, Kuntowijoyo gave a critique based on the Islamic view that self-actualization in Maslow's humanism is contrary to Islamic teachings. That is in terms of the conception of human.

However, the learning theory built on the philosophy of humanism can also be applied in mathematics education by adapting it, of course, to the Indonesian context which is full of religious and cultural values. A good example of this is the differentiation of mathematics learning. Through this learning differentiation, all students learn in different ways and according to their level of difficulty in understanding mathematical concepts. Based on the level of difficulty faced in learning mathematics, students can be classified into certain levels, for example, Level I, II, and III. There are also students who are in upper-grade and lower-grade levels. Each student gets treatment according to his or her needs

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