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THE IMPLEMENTATION OF ISLAMIC VALUES IN MATHEMATICS EDUCATION

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Abstract

Secularism which began in Italy during the 15th century has given big impact to Muslims in the field of Mathematics education. Up till now, the teaching of Mathematics is based on secular philosophy which neglects spiritual elements. Thus, Mathematics curriculum should be revised by implementing Islamic values, so these can be applied by students at an early age. This paper presents the five examples in mathematical knowledge of the number "1", the fractions, the optimization, the concept of "Hexagon" and diagram "Venn". Thus, the application of Islamic Mathematics is important to produce mathematicians who have faith in Allah SWT.

Keywords: Implementation; Islam; Education; Mathematics; Tawhid

1. Introduction

Since the 16th century to 20th century, the West has had great power towards Muslim countries before they gained their own independence. The colonial educational system has its own agenda because since then, secularism was greatly practiced while religion was gradually neglected. Thus, some Muslim scholars claimed that educational system is the most effective platform in spreading secularism among Muslims. This is because the West had adopted secularism in education especially in Mathematics, and since then, our Muslim students' thinking is strongly influenced by secularism. Besides, there are no spiritual values being practiced in Mathematics disciplines until today. As a result, students only learn Mathematics without integrating the subject with the Islamic norms. Mathematical indeed had a very close relationship with the Muslim spiritual tradition, familiar with the Qur'an, and mathematics course can also be a "road" that can lead a person to achieve happiness in the world or the hereafter.

2. The History of Mathematics in Islam

Islamic historians were of the view that " Islamic Mathematics" refers to the mathematics developed by the mathematicians from the Islamic culture. This began from the Islamic golden period until the 17th century. Majority of them were Arabian and Persian mathematicians and also the Muslims and non-Muslims who mostly came from the Islamic culture. Islamic mathematicians were also known as Arabian mathematicians since the text was based on mathematical text written in Arabic.

However, the meaning of "Islamic mathematics" in this article focuses on applied mathematics with Islamic elements to be incorporated in the curriculum exists for a holistic education. In other words, values which make individuals realize and recognize Allah SWT as the Creator should be practiced in the teaching and learning of Mathematics.

The ancient Egyptians had an amazing knowledge of the human brain, anatomy, astronomy and Mathematics. They also learned the negative numbers. However, their knowledge was lost in the tides of history. Consequently, the knowledge was not passed down to generations of men. Nevertheless, Newton then rediscovered the negative numbers. The legacy of the Islamic mathematics during the ancient Egypt was then continued by the Greek thinkers; Pythagoras and Plato. The concept of the numbers presented by Pythagoras was both spiritual and scientific. Pythagoreanism and Platonism stream had greatly influenced the thinkers of various religions such as Judaism, Islam and Christianity in the Middle Ages (Osman Bakar & Azizah Hamzah, 1992).

3. The Implementation of Islamic values in Mathematics Education

Mathematics is one of the disciplines in science. Until now, the mathematics being taught starting from the pre-school to higher education institutions is the one based on secularism, and this neglects religious values. Besides, teaching mathematics is more about making calculations to be applied in specific fields related to daily life only, while the more practical one is obviously more than what human does every day. The science of mathematics embodies physical and spiritual values. This paper demonstrates three examples of mathematics being integrated with Islamic norms in order to drive a person to submit himself or herself to Allah SWT as the Creator of the Universe through the knowledge of Mathematics. Al-Qur'an displays many mathematical concepts such as the concept of collection, number, measurement, statistics, estimations, and others. Minority of teaching mathematical discipline that touches on the hidden meanings behind abstract concepts found in mathematics. Thus out, it was very necessary to understand the mathematics knowledge in a holistic framework.

3.1 Number "1"

The formation of numbers matches the formation of creatures. Numbers are sample from the higher Universe; and from its knowledge, one may understand the science of mathematics such as physics and metaphysics. Science/knowledge of numbers are the "root" to other disciplines, the foundation of wisdom and the source of knowledge (Seyyed Hoessein Nasr, 1984)

The first is related to number one that exists when a person starts counting. Normally, a person will begin counting by saying number one. Number one is a very important figure and thus, it is placed at the beginning of the sets. Number one is not only referring to the common number in Mathematics calculation, but it demonstrates the concept of Tawhid to Allah SWT or God as One. Knowledge about number and its origin from number one (before two) symbolizes the knowledge about Allah is One. When a person starts the calculation with number one, one should remember Allah as One. The uniqueness of number one lies on the greatness of Allah as One, not two, three and onwards (Hoessein Seyyed Nasr, 1984). The reminder that Allah is One would make someone worship Him and not compare Him with other things. Allah says in Surah Al-Ahad, verse 1, which means:

> *"Let's say that Allah is the One".*

Therefore, this method of teaching will strengthen one's faith towards Allah SWT. This sort of thing needs to be applied in the teaching of mathematics, so that students would understand the two dimensions of Mathematics which is closely related, namely the physical and spiritual. The knowledge of numbers centralized in the soul and every human should reflect and think deeply before these become clear.

3.2 Fractions

Next is fractions. The concept of fractions in Mathematics being taught by teachers in the primary school, the secondary school and the university is more towards the division of pies, circles, squares, cakes, toys and others which were presented in the text books. However, the learning of fractions has its own implied meaning. Rationally, fractions demonstrates the dimension of justice by Allah SWT (Shaharir Mohd. Zain, 2004), which suits Allah's name *al-'Adl* (The Most Fair). Through fractions, justice can be gained. This also applies in the distribution of *faraid* or estates. When someone passed away, his or her family members would face problems in distributing the wealth. The justice in distributing the properties means giving them away to family members or relatives, suitable with the position, status and responsibilty in the family, society and religion. Therefore, justice in the distribution of estate is not necessarily made equal among the members of beneficiary, without considering the relationship with the dead, gender (men or women) or the responsibility in the religion (Mohd. Ridzuan Awang, 2003). The division inheritance is recorded by Allah SWT in Surah al-Nisa', verse 11 which means:

> *"Allah (thus) directs you as regards your Children's (Inheritance): to the male, a portion equal to that of two females: if only daughters, two or more, their share is two-thirds of the inheritance; if only one, her share is a half. For parents, a sixth share of the inheritance to each, if the deceased left children; if no children, and the parents are the (only) heirs, the mother has a third; if the*

deceased Left brothers (or sisters) the mother has a sixth. (The distribution in all cases ('s) after the payment of legacies and debts. Ye know not whether your parents or your children are nearest to you in benefit. These are settled portions ordained by Allah; and Allah is All-knowing, Al-wise."

The value obtained from the Mathematics fractions is rational because the the calculation is made carefully and honestly to avoid any injustice in the distribution of *faraid*. If this was neglected, it may lead to disatisfaction among people. Allah SWT mentioned this in the Holy Quran in order to provide good and justice to all human. Thus, the learning of fractions is not only meant for the physical knowledge, but it teaches justice through the Islamic norms. This particular concept should be understood from the physical and spiritual aspect.

3.3 The Concept of Optimization

Mathematical optimization is maximizing or minimizing at its best to aim the best and fair elements. There are many paradigms in this concept including utility. In textbooks, axioms are needed to support the paradigms in order to create the utility concept. However, the text books authors did not explain the axioms in details. The assumptions given behind the symbols used defined as if human is capable to compare his needs through priority, human is always rational and greedy while happiness can be obtained through materials alone (Shaharir Mohd. Zain, 2000).

Besides, Western scholars themselves are also not satisfied with this Mathematics and they had tried to improve it by their own value system since 1930's. However, only at the end of the 1970s that the new Muslim scholars questioned this and they suggested for modifications. Thus, appropriate assumptions to the norms of Islam should be practiced. For instance, happiness of a person is determined by the level of spiritual and physical attainment by giving priority to basic needs (obligatory/*wajib*) followed by luxury requirements (additional/*sunat*, permitted/*harus*) and also leaving what is forbidden (*haram)*. This should be observed by students, so that they can balance their life between the world and the Hereafter. Thus, students would not regard materials as the aim for the present life since life in the Hereafter is eternal.

3.4 The concept of "Hexagon"

In mathematics, "Hexagon" has six pedestal shaped and has vertical sides of the triangle-shaped. This form is not merely to measure angles, area, space, developed and similar to it, but more important is to look at the spirit behind the development of the "Hexagon" is. Instructors should relate this form of spiritual values that recognize the rule of faith consists of six items. When we see, both of these things are interconnected. Here forwarded wake Hexagon space intended.
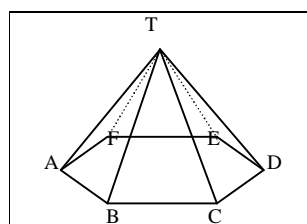
Pic. 1. Hexagon

Description:

T = Faith
A = Belief in God
B = Belief in Angels
C = Belief in the Books of Allah
D = Belief in the Apostles
E = Belief in the Last Day

F = Belief missed days and Honor

From the picture above, Hexagon has seven vertices that is ABCDEF and T. T is the high point of a Hexagon that looks as one's faith. Six lines interconnected to lead her to the point T as faith, because of the loss of only one line, then the shape of Hexagon will not be standing still. This is in line with the concept of one's faith, because if one of the five pillars of faith bias, then one's faith will not be perfect.

3.5 "Venn" Diagram

In a Venn diagram that there are certain portions thereof. These parts consists of collections of and in the compilation of the elements there. Assembly in the Venn diagram is a collection of all the objects referred to as a collection of the universe.Venn diagram of this concept can be aligned with the values of Islam are applied by a Muslim in his life. The spiritual message behind this Venn diagram associated with the levels of one's faith to the Lord the form Muttaqin Mukhsin, Mukmin, and Muslim. Venn diagram can be described as follows.
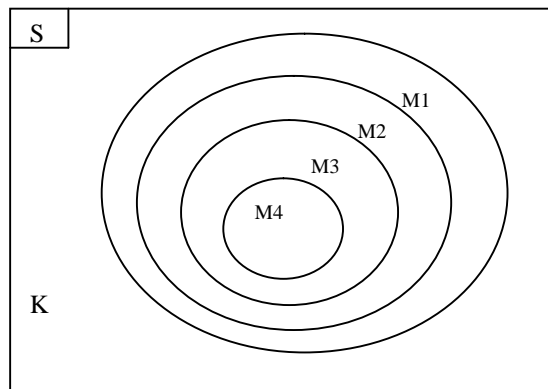
Diagram 1. Venn Diagram

Description:

S : The Islam
M1: Muttaqin
M2: Mukhsin
M3: Mukmin
M4: Muslim
K: Infidelity

Based on the picture diagram above, it can be explained that there are several groups of people in the sight of Allah which has a position on the certain level. The most perfect Muslim is that when it has reached the stage Muttaqin of those who fear their Lord in total to fulfill the commandments of God and leave all evil. The second form is Mukhsin the people who do all sincere his/her worship only to God alone. While the third floor also is a Mukmin believer who Istiqomah or consistency and adherence to the truth, including in matters trivial. The lowest under the Muslim is the person who his/her has witness to God, and has trust, and in this case, and submissively obedient to God.

In accordance with the word of God in his An-Nisa ', verse 88 which says:

> *"Then why are you (split) into two golongandalam (face) hypocrites, Allah has overthrown them as apostates, due to their own efforts? Would you desire to guide those who have been led astray Allah leads astray whoever Allah, shall you not find a way (to guide) him "*

CONCLUSION

For centuries, Mathematics is known as knowledge that is used in many branches of science. However, priority is less given towards its practice, importance and relevance towards the spiritual aspects. The integration between Mathematics and Islamic values is important because Mathematics is one of the mechanism to meet the demands of human life, especially in becoming a good servant of Allah SWT. Thus, Mathematics should be seen and learned from these two angles even though the concept is one.

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