

Published by Tadris Matematika IAIN Syekh Nurjati Cirebon EduMa: Mathematics Education Learning And Teaching July 2021, Vol 10 No 1 Page 107 – 116 <u>https://syekhnurjati.ac.id/jurnal/index.php/eduma/index</u> p-ISSN: 2086-3918, e-ISSN: 2502-5209



MATHEMATICS EDUCATION LEARNING AND TEACHING article link: <u>https://syekhnurjati.ac.id/jurnal/index.php/eduma/eduma/article/view/7890</u>

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Analysis of Islamic Value in Learning Mathematics Era 4.0

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article info

How to cite this article:

Abdullah, B.M., Murtiyasa, B., & Fuadi, D. (2021). Analysis of Islamic Value in Learning Mathematics Era 4.0. *Eduma : Mathematics Education Learning And Teaching*, 10(1), 107 - 116. doi:http://dx.doi.org/10.24235/eduma.v10i1.7890

Article history: Received: 27 01, 2021

Accepted: 14 03, 2021

Published: 07, 2021

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abstract

The challenge of education today is a generation that is starting to weaken its work ethic and religisitas. This makes teachers need to equip students with material that is integrated with Islamic values, including in mathematics learning. The purpose of this study is to describe Islamic values in mathematics learning in the era of 4.0 by knowing how to implement it and mathematical topics that can be integrated with Islamic values. The research subjects consisted of mathematics subject teachers and students. Through observations and interviews, it was found that Islamic values of patience, honesty, never giving up and tawakkal were integrated in mathematics learning. The implementation of Islamic values is carried out by linking mathematics learning materials with the content of the verses of the al-Qur'an

Keywords: Islamic Values, Al-Qur'an, Learning, Mathematics



INTRODUCTION

The challenge of education today is a generation that is starting to weaken its work ethic and religiosity. This is due to the rampant misuse of gadgets today. It was proven by students tend to rely on cellphones to count so that the willingness of students to practice counting is less. Teachers must be ready to face challenges in educating students of different generations and different characters (Elhoshi et al. 2017). Students today are in an era where everything is instantaneous and easy. Sumardianta (2018) calls them with millennial students (Gen Y), namely students who are nurtured in the civilization of computers, the internet and artificial intelligence. A generation with a line between play and learning is almost indistinguishable. They are always connected to social media, so they prefer to collaborate rather than compete. Priyatmi in Setiawan (2019) also states that the current generation is a generation that was born and grew up with technology and uses it to communicate. They need skills and creativity as well as being innovative in learning, so they can solve problems in their own way.

Education in Indonesia is currently education that only looks at the grades achieved by students without paying much attention to the process of getting grades. Masduki (2014) said that students to be successful if they get high academic scores. As a result, many students have high academic scores but their morals are not directly proportional to high academic scores. Sumardianta (2018) also states that students are lazy to learn, but endure for hours and are addicted to online games, so the education system must be re-engineered in a format that is acceptable to a generation of students who cannot be separated from gadgets. Even based on Kompas.com (2020), PISA states that Indonesia is in the seventh bottom of 78 countries as seen from a survey of students' abilities in mathematics competency scores. For this reason, the purpose of education should aim to create a total and balanced development of the human personality, namely through various exercises, spiritual, intellectual, rational as well as feelings and sensitivity to the human body (Awwaliyah, R & Baharun 2018).

The teacher's lack of awareness to integrate Islamic values in every mathematics lesson makes most students think that learning mathematics is how to master the material presented by the teacher. Firdaus in Fitriyani (2019) said that learning can be used as a way to instill the character of Islamic values as a step in increasing the faith and piety of students. Khoiriyah (2018) also said that with a mathematical approach it does not mean that Islamic values are low, but it is to increase the belief that all knowledge is of good value and leads people to true goodness and increases faith and devotion to Allah SWT. Islamic values that are important in Islamic teachings, Aqidah, Akhlak, Respect for Reason, Humanity, Sustainability, and *Rahmatan Lil 'Alamin* (Ristanti et al. 2020). Hakim in Riskiyah (2020) states that the value of faith teaches humans to believe in the existence of Allah SWT who always supervises and calculates all human actions in the world. Moral values teach humans to behave according to good manners. Social values are some of the rules regarding the association of human life in the world. While the value of worship is to teach humans to always seek the pleasure of Allah SWT.

Mathematics learning is expected to lead students to success which is manifested in the form of achievement and also changes in attitudes of religious awareness. One way to realize mathematics learning that contains Islamic values and is adapted to the reality of life development is one of them with the help of science and technology. Even so, the development of Science and Technology (IPTEK) in addition to having a positive effect also has a negative effect (Taufiqurrochman et al. 2020). With technology, effective and interesting learning will be easy to create, and make it easier to explain something complex. The existence of the industrial revolution 4.0 has triggered the development of digital technology which will affect mathematics learning (Rahmadani et al. 2020). Therefore, Marto (2020) said that in the 4.0 era, mathematics teachers required character, skills and literacy competencies in presenting varied and innovative learning and mastering and being able to utilize digital technology in learning. On the other hand, in order to improve the quality of education, educational institutions are also required to be able to adapt appropriate technological developments in the learning process (Budiman 2017). Muyasyaroh (2020) concluded in his research that there was an increase in the level of understanding of Islamic values from the millennial generation with the existence of technology-based learning in the form of learning media with Android

The form of character values are Islamic values that are in accordance with Islamic law and are guided by the Al-Quran and As-Sunnah. The integration of Islamic values in mathematics learning is expected to form humans who fear Allah swt, have faith and have a tough soul and are oriented towards science and technology (Sari 2018). Mathematics learning that contains Islamic values can be an alternative in realizing the improvement of the quality of National Education, which aims to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, are knowledgeable, creative, independent, healthy, and become citizens. responsible and democratic (Sujana 2019).

The purpose of this study is to analyze Islamic values that can be taught through mathematics learning and to find out topics that can be related to Islamic values in increasing faith and taqwa to Allah SWT.

METHODS

This research uses a case study design. Sutama states that a case study is a type of approach in research that examines one case, and is carried out intensively, in-depth, in detail and comprehensively (Sutama 2019). In this study, the phenomenon is in the form of Islamic values in mathematics learning at SMK Muhammadiyah 2 Wuryantoro. The subjects involved in this study were 36 students of class X Accounting, consisting of 10 males and 26 females. These students were then grouped into 9 groups randomly and heterogeneously.

The data sources of this research are primary data and secondary data. Primary data obtained by researchers directly from respondents through observations, interviews and observations. Meanwhile, the secondary data were obtained by researchers from notes or documentation

The data validity test in qualitative research includes credibility, transferability, dependability and confirmability tests. (1) credibility test can be done in various ways, including extension of observations, increasing persistence in research, triangulation (triangulation of sources, triangulation of techniques, triangulation of time), discussion with peers, negative case analysis and member checks. (2) transferability is external validity to indicate the degree of accuracy or applicability of research results in the population where the sample is taken. (3) dependability, the testing process carried out by auditing the entire research processes. (4) confirmability, which is also called the objectivity test of research, namely testing the results of the research and relating it to the process being carried out (Sutama, Sumardjoko, B., Supriyanto, E., Narimo, S., Maryadi 2017).

The method used in testing the validity of the data in this study is triangulation method. Triangulation in data validity testing is defined as checking data from various sources, ways and at various times.

Discussion and Results

The results of research conducted at SMK Muhammadiyah 2 Wuryantoro, it shows that there is an integration of Islamic values in the mathematics learning process. This can be seen from the mathematics learning process in class X Accounting which emphasizes the importance of understanding the meaning of the Qur'an which is associated in learning and in living daily life. It is proven by the efforts of mathematics teachers to integrate Islamic values in learning mathematics. This effort is carried out in learning mathematics by using the method of providing illustrations through learning videos sent through google classroom. This effort is made to shape the Islamic character of students by considering existing technological advances. This is in line with the results of research conducted by Eissa and Khalid (2019) who concluded that Islamic-based schools should pay attention to the development of an integrated Islamic curriculum in teaching non-religious subjects related to moral cultivation. This is in line with the results of research from Khoiriyah (2018) who concluded that the importance of connecting the concept of Islamic life with mathematics as a way of forming the character of students. So we need a continuous process in the development of mathematical material analysis associated with the verses of the Qur'an.

The planting of Islamic values in mathematics learning is very important. Without the cultivation of Islamic values in learning, the Islamic character of students will be difficult to form in the present. Good intentions and plans are not without obstacles. Constraints that often arise include not all material in mathematics that can be integrated with Islamic values, not all teachers are able to deliver material that is integrated with Islamic values, student readiness in receiving lessons and the factor of mathematics lessons that are sometimes found in the last hour.

This study found that the topics of discussion in mathematics integrated with Islamic values include:

1) The graph of the exponential function. It is explained that the rising monotonous graph illustrates that love for Allah exceeds love for the world.

... الْمُوْتِ وَكَرَاهِيَةُ الدُّنْيَا حُبُّ» قَالَ الْوَهَنُ وَمَا اللَّهِ رَسُولَ يَا قَائِلٌ الۡفَقَ

"... Then someone asked," What is 'wahn'? " Rasulullah said, "Love the world and fear death"(Narrated by Abu Daud and Ahmad)

With the delivery of this integrated material, it is hoped that the students will understand the graph of the exponential function, they will also have an awareness of the importance of maintaining faith. It is illustrated with a monotonous ascending graph to illustrate that faith will increase along with loving Allah more than loving the world. Based on the observations made, it was noted that the teacher made preparations and learning steps that were integrated with Islamic values. The first step is the teacher instructs students to look for material references to be studied from books or internet media, namely about the graph of the exponential function. The second step, the teacher prepares a hadith History of Abu Daud and Ahmad related to wahn. The third step, the teacher forms groups and instructs them to analyze the relationship between the rising monotone graph material and Al-Wahn and present it.

The following is an excerpt of interviews conducted by researchers to teachers and students:

Researcher : What is today's lesson about, sir?

Teacher: Learning about exponential functions, according to the lesson plan that I made Researcher: May I ask for a copy of the RPP?

Teacher : yes, this please.

Researcher: How important is this exponent material related to this hadith?

Teacher : Yes, sir, considering that today's millennial generation is all sophisticated, I'm afraid they are too in love with the glitter of the world, which is easy and simple, to the point that they forget the creator.

Researcher: Can the teacher's efforts to integrate Islamic values be understood? Student : Alhamdulillah, sir.

2) Arithmetic sequences, are materials in mathematics learning that teach regular patterns of arithmetic sequences and series.

Following are the results of interviews with teachers & students:

Researcher : Today's meeting, what material will you convey?

Teacher : This meeting is planned to discuss Arithmetic Rows and Series integrated with Islamic values, mas

Researcher : How is the mother's learning step as a mathematics teacher in integrating this?

Teacher: Previously, this material about sequences and series was studied by students in 9th grade junior high school, so this is just a development on contextual questions with Islamic nuances. God willing, this has been stated in the RPP that I made. One day before the lesson, I gave instructions to the students through googleclassroom to find references on youtube related to videos of the solar system. Then I asked them to look for references also about the solar system

Researcher: From your group, did you find the verse according to what was instructed?

Student: Our group found sir, namely QS Ar Rohman verse 5 which is about the circulation of the sun and moon according to their calculations

Based on the results of observations, the learning steps taken were asking group representatives to present the results of discussions about the relationship between arithmetic sequence material, solar system videos, verses of the Koran, and determining the hijriyah date based on the essential science of reckoning used by Persyarikatan Muhammadiyah. At the end of the lesson, the teacher gives questions to students to determine the beginning of Ramadan and 1 Shawwal 10 years later. This is done with the hope that students are able to understand the concept of arithmetic sequences and series that are integrated with Islamic values. This is similar to the results of research from Sobarningsih et al. (2019) which concludes that students respond well to Islamic nuanced math problems in the hope of instilling good character values in students.

- 3) Geometry Sequence, is a number sequence material composed of terms that have a fixed ratio/ratio. This material is trying to be associated with the promise of Allah swt in QS Al Baqoroh verse 261 about the reward of people who like to give alms. The steps taken are to give students the task of writing a simple article about the relationship between geometric sequences and QS Al Baqoroh 261. This article is then sent via google classroom according to the specified schedule.
- 4) Rules of angles in right triangles (Trigonometry). In this lesson, students are invited in groups to make a simple measuring instrument (clinometer) to measure the height of an object. The object being measured is the same, but the measuring distance between the objects with the measuring distance of each group is different. This is done to ensure whether the same height measurement from each group on the same object height. The task of each group is to make a report in the form of a powerpoint that is presented. In this case, the teacher prepares a verse of the Qur'an about the prohibition of being arrogant and arrogant, namely QS Lukman verse 18 which will be delivered when giving responses or reinforcement to students. This is done by predicting the calculation from each group that there is a difference in measurement. The hope of this lesson is to understand the concept of trigonometry and invite students to realize the limitations of their own abilities and understand differences so that they can avoid being arrogant by feeling that the calculations from their group are the most accurate.

This step is the same as that done by Nindarti, Suherman, and Anwar (2018) in their research which concludes that there are steps to increase students' understanding of trigonometry concepts using trigonometry pocket books based on Islamic values.

5) Graph of the sine function. At point 0[°] to point 90[°], the line on this graph shows an increase from point 0 (start) to the top point on the graph. Meanwhile, from point 90[°] to point 180[°], it shows a decrease from the peak point to the zero line (0). The teacher's step in integrating with Islamic values in this material is to provide an explanation of the phases of human life. The basis that was raised was QS Ar Ruum verse 54 which stated that humans were created from a weak state (infant), then strong (teenagers/adults), and then weak again (old). With this explanation, it is hoped that students will gain learning

and awareness that the phases of human life resemble a sine graph. It means that there is nothing to be proud of in this world.

6) System of Linear Equations 2 Variables. SPDLV is famous for the concept of elimination and substitution. The concept of elimination teaches students that in living life in this world, one must have the skills to choose and decide what is good and what should be left behind. While the concept of substitution, students are taught to always make a priority scale in their lives. In this case, the teacher provides an explanation of the meaning of studying the SPLDV material by taking the basis of the Qur'an Surah Al Mujadillah verse 11. This basis is taken with the hope that students are able to understand the concepts of elimination and substitution as well as the importance of studying and practicing it. This is in line with the results of Nasaruddin's research in Khoiriyah (2018) which concludes that by studying the principles of elimination and substitution, there is a lesson to be learned, namely that differences can only be united by eliminating selfishness in ourselves and complementing each other's shortcomings.

The results of observations on the Islamic value of student learning have been carried out by researchers. The student's Islamic value observation sheet consists of 6 statement items. The results of the observations are presented in the following table:

Aspect 1	Percentage
Exponential function graph	73,00%
Arithmetic sequences and series	82,00%
Geometric sequences and series	78,00%
Rule of angles in right triangle	68,00%
Graph of sine function	70,00%
System of Linear Equations 2 Variables	92,00%
Average	77,17%

Table 1. The average observation result of students' Islamic values

CONCLUSION

Based on the results of the analysis and data collection carried out by the author, conclusions are obtained from research on Islamic Value in Mathematics Learning in the Era 4.0 as follows:

1) The first Islamic values integrated in mathematics learning are patience. Learning mathematics teaches patience to students starting from the procedures, characteristics, norms, and axioms. The second Islamic values integrated in mathematics learning is honesty. This value can be seen in every problem execution. If the problem is done dishonestly, it will be easily detected by looking at the steps in the problem solving. The third Islamic values integrated in learning mathematics are never giving up. Where

students are required to be able to solve questions with the correct concept and repetition should always be done so that students always find it easier to solve questions of various types. The fourth Islamic values integrated in mathematics learning is tawakal. Students are taught to tawakal or surrender after making maximum efforts, starting from understanding concepts, memorizing and understanding formulas, and working on math problems.

- 2) The implementation of Islamic values in mathematics learning is carried out by linking learning materials with Islamic values in the Qur'an.
- 3) Topics that can be inserted with the natural values include, for example, material for integrated exponential function graphs with the importance of maintaining faith, Arithmetic sequence material with the science of computation / astronomy, Material geometric lines with the priority of alms, Material about the rules of angles in a right triangle by inviting always Gratitude, Graphic material for the sine function of human life phases, Opportunity material with destiny, 2-variable linear equation system (SPLDV) material with a priority scale, scalar and vector concepts with the purpose of life, Mathematical logic material with faith in Allah, and Material mean / average calculation mathematics with estimates of charity.

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