

Phenomenology: Integration of Islamic Values in Mathematics Learning at a Pesantren-Based Senior High School in Yogyakarta

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Abstract

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The integration of mathematics learning and Islamic values is very important to be implemented. Mathematics learning that is integrated with Islamic values can shape students to have insights and morals that are in line with Islamic values. This research aims to find out the integration of Islamic values in learning mathematics in pesantren-based high schools. The method used in this research is a qualitative method with a phenomenological approach. The research subjects were taken with purposive sampling technique, namely four mathematics teachers in two pesantren-based high schools in Yogyakarta. The analysis technique used was data reduction, data presentation, and conclusion drawing. Data collection techniques were carried out by structured interviews. The data collection instrument was an interview guideline that had been validated by 2 experts. Based on the interviews, information was obtained that teachers have integrated Islamic values in mathematics learning, but only limited to certain materials because mathematics is considered abstract so it is difficult to connect with Islamic values. The research findings related to the application of Islamic value integration in mathematics learning in pesantren-based schools are: (1) integrating Islamic values in mathematics learning is considered important; (2) teachers experience various obstacles in the planning process of integrating Islamic values in mathematics learning so that teachers are less capable in the implementation process; (3) despite experiencing various obstacles, teachers try to apply Islamic values in mathematics learning in some materials, for example in probability and derivative materials; (4) guidance is needed for teachers to be able to integrate Islamic values in mathematics learning.

Keywords: integration, mathematics, pesantren-based school

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Introduction

Article 1 of the Indonesian Law No. 20 of 2003 states that education is a designed way to create conditions and active learning situations so that students can maximally improve their abilities including spirituality, character, intellectual, morals, skills, and self-discipline needed by students and society. Learning will be meaningful when teachers can integrate Islamic values into learning so that students are smart, disciplined, and have high religious values (Imamuddin et al., 2020). A science will be complete when there is integration with one another (Sugilar et al., 2019). Sometimes these sciences can be related and influence each other, for example, we can integrate Islamic values and mathematical concepts that can be applied to the learning process.

Integrating Islamic values into learning means eliminating the separation of science and religion (Chanifudin & Nuriyati, 2020). Religion can influence the learning process and strengthen science because the Qur'an contains kauniyah verses, which are verses that correlate with the universe and can provide a lot of guidance for us in studying science (Rizkia et al., 2022). The Qur'an has a mathematical structure that makes religious values very likely to be integrated with mathematics learning (Al-Faqih, 2017). Several mathematicians develop mathematical studies that refer to the Qur'an, such as arithmetic, algebra, geometry, and number theory. Muslim scientists use Qur'anic verses to develop mathematics (Hussain & Ramli, 2017). According to Sugilar et al (2019), integrating the Qur'an with mathematics learning can make students believe in the power of Allah SWT. One of the educational models that integrate science with religious values is pesantren-based schools (Ria, 2016).

A pesantren-based school is an educational model that combines school and pesantren institutions (Kusnandi, 2017; Saepudin, 2019; Fachrudin, 2021). The two social systems have their advantages, which when combined will create a generation of excellence and character (Suhardi, 2012). Pesantren-based schools emerged due to the awareness and discussion of institutions from the Ministry of Religious Affairs, Ministry of National Education, schools, and pesantren (Nurochim, 2016). The purpose of pesantren-based schools is to create people of faith and piety along with mastery of science and technology, so that they can be useful in society (Suheli, 2018; Saepudin, 2019). One of the efforts to achieve this goal is to integrate school subjects, one of which is mathematics with Islamic values.

Integrating mathematical concepts with Islamic values is so important to be implemented to form students with character (Fitriyani & Kania, 2019). Mathematics learning that is integrated with Islamic values can help students achieve insights and morals that are in line with Islamic values (Sobarningsih et al., 2019). In line with this, Mufidah (2018) said that positive thinking and good motivation from students can arise from learning that is prepared to build a positive personality through Islamic values. Students will have a higher level of spirituality when subjected to Islamic-integrated mathematics learning compared to students subjected to conventional learning (Setiawan & Thahir, 2016).

Several researchers chose research on the integration of mathematics with Islamic values to be studied. Some of these studies focus on developing tests that integrate mathematics with Islamic values (such as Rozi et al., 2020; Immamuddin et al., 2022), developing mathematical abilities with various learning methods and textbooks integrated with Islamic values (Supriadi, 2015; Yusnita et al., 2016). However, no research focuses on how teachers integrate mathematics learning with Islamic values in pesantren-based schools. Pesantren-based schools must have a vision and mission that requires teachers to integrate learning with Islamic values. According to Kurniati (2016), integrating mathematics learning with Islamic values is very important to be implemented as a form of effort to develop students' morals. In the field, it is not uncommon to find teachers who encounter obstacles in integrating mathematics and the Qur'an (Absdussakir & Rosmanidar, 2017). Therefore, this study was made to find out how pesantren-based schools integrate mathematics learning with Islamic values.

Methods

This study uses a qualitative method with a phenomenological approach to describe how pesantren-based schools can integrate Islamic values and mathematics. A phenomenological approach is an approach of qualitative research conducted to describe the phenomena that occur in the subject under study (Cresswell, 2007). Data collection in this study used structured interview techniques conducted with research subjects who were four mathematics teachers in two pesantren-based schools in Yogyakarta. The two schools have similar characteristics with all students being students of the boarding school and the school and boarding school have the same foundation. The selection of research subjects used a purposive sampling technique. The purposive sampling technique is a sample collection that requires consideration so that the subject matches the criteria needed in the study.

Data analysis in this study used qualitative data analysis techniques, namely: (1) data reduction, which is the process of sorting out important things and then simplifying them so that they can focus on the main things that will be needed. At this stage, researchers recorded the results of structured interviews with the four teachers in two different schools related to mathematics integration in these schools; (2) data presentation in the form of narrative text that informs the data that has been summarized and arranged so that it is easier to understand for the implementation of the next stage of research. The data compiled is relevant so that it can be concluded into information; (3) conclusion drawing is done by summarizing the results of the research that has been carried out. The main results of the research are obtained from the conclusion.

Result and Discussion

Rapid modernization makes the negative influence of globalization easily reach children today. This encourages parents to send their children to pesantren-based schools with the idea that their children can master general knowledge as well as religious knowledge well (Nety et al, 2020). Pesantren-based schools generally have a vision and mission of making a combination of pesantren culture and school management which aims to build integrated learning with Islamic values. Based on interviews with mathematics teachers from both schools, information was obtained: (1) the goal of pesantren-based school A is to create a generation of young people who are faithful, knowledgeable, and devoted to Allah SWT and (2) pesantren-based school B has the vision to create a generation with Qur'an personality and able to actualize in the life of the nation. Based on the vision and objectives that have been conveyed, learning in pesantren-based schools is expected to integrate mathematics with Islamic science. This is because there are verses in the Qur'an that can be the basis of science including mathematics (Ramli, 2014). Table 1 summarizes some of the problems in designing mathematics lesson plans.

Table 1. Problems in designing mathematics lesson plans integrated with Islamic values

Data	Theme
Not yet able to develop lesson plans that integrate mathematics with Islamic values.	Lack of teacher preparation to integrate math learning with Islamic values
Not yet developed evaluation questions that integrate Islamic values with mathematics learning.	
The learning module was created without integrating mathematics learning with Islamic values.	

Unfortunately, the implementation process is inseparable from the obstacles that cause less than optimal integration of learning with Islamic values (Nasrullah, 2017). The following are the results of interviews obtained between Researcher (S) and Mathematics Teacher 1 (T1) regarding the integration of Islamic values in mathematics learning:

S: *"Has the lesson plan that has been prepared integrated mathematics learning with Islamic values?"*



T1: *"The lesson plans that have been prepared have not integrated mathematics learning with Islamic values"*

Based on the results of these interviews, teachers have not been able to develop lesson plans and learning tools that can integrate mathematics with Islamic values. One of the obstacles that a teacher has when integrating Islamic values in mathematics learning is the assumption that mathematics is too abstract to be connected with Islamic values, as stated by mathematics teacher 2:

S: *"What is the biggest obstacle you face when preparing learning tools that contain Islamic values?"*

T2: *"The biggest obstacle is linking each material with Islamic values, to connect the material in mathematics is not always possible because mathematics is abstract."*

The same obstacles owned by teachers in both schools are reinforced by the opinion of Safitri et al (2020) that several aspects need to be considered when a teacher wants to integrate Islamic values into learning, namely the religious aspect itself, the material aspect, and the suitability in everyday life so that students can live it well. In addition, the lack of references is a major influence for teachers in integrating Islamic science with general science (Aziz, 2018). About the design, there are also problems in implementing the integration of Islamic values with mathematics learning. These problems are listed in Table 2.

Table 2. Problems in implementing mathematics learning integrated with Islamic values

Data	Theme
Quality of human resources Less able to implement the integration of mathematics learning with Islamic values.	Enhanced human resource capabilities

Teachers in pesantren-based schools do not have a strong Islamic education background and the assumption that mathematics is a difficult science to be associated with Islamic values. Therefore, in pesantren-based schools, teachers are briefed on Islamic science with learning with the hope that teachers can apply the results of the briefing in the learning process. The results of the interview between the Researcher (S) and Teacher 1 (T1) are as follows:

S: *"Have you implemented the integration of Islamic values in mathematics learning?"*

T1: *"In classroom learning, there is still a lack of integration of mathematics with Islamic science because the material in mathematics is rather difficult to relate to certain hadiths or Quranic verses. However, in the madrasah, there is a routine activity agenda where teachers present several hadiths that are related to the subjects they teach in groups."*

This is in line with the opinion of Ibrahim (1986) who said that when a teacher is less able to manage learning, this ability must be improved immediately. Increasing this ability is related to the professionalism of a teacher to carry out the teacher's duties as a teacher and educator optimally (Nuriyatun, 2016). Unfortunately, not every pesantren-based school conducts debriefing for teachers to integrate mathematics learning with Islamic values. One of the schools that did not conduct debriefing for teachers to integrate mathematics learning with Islamic values is pesantren-based school B. This was obtained from the results of interviews with teachers at the school. This was obtained from the results of interviews with teachers in pesantren-based schools who said that teachers tried independently to deepen their ability to integrate mathematics learning with Islamic values.

Although there are many obstacles faced in the process of integrating mathematics learning with Islamic values, based on the results of interviews, the four mathematics teachers in pesantren-based schools have a high awareness of the importance of integrating mathematics learning with Islamic values.

- S: *"According to you as a teacher in a pesantren-based school, is it important to teach students about Islamic values in mathematics learning? If it is important, how do teachers try to integrate these two things?"*
- T3: *"Very important. For example, the material of opportunities can be related to events that are sure to happen and impossible to happen. The chances of getting happiness in the afterlife will be great if we do more good than bad while in the world."*

In the interview with the fourth teacher, the same results were obtained, only the integration of different materials.

- S: *"According to you as a teacher in a pesantren-based school, is it important to teach students about Islamic values in mathematics learning? If it is important, how do teachers try to integrate these two things?"*
- T4: *"It is important, an example of integration is the hadith:*

"If one of you is angry, let him try to keep quiet." (HR Ahmad, from Ibn Abbas)

In mathematics, this angry condition can be likened to an ascending function, which is when a person's emotions rise, then will reach the peak point of anger, and then become silent. The silence here is a condition in which a person dampens anger, neutralizes emotions, and waits for the anger condition to subside to talk about the problem and solve the existing problems. After everything is discussed, the emotions and anger will decrease, which is likened to a descending function in mathematics.

Thus, when we are in a state of anger that has reached its peak, it is best to keep quiet. Reduce anger, neutralize emotions, and wait for a cool head to be able to talk about the problem and solve the problem at hand."

The opinion of the four teachers about the importance of integrating mathematics learning with Islamic values is supported by Sari (2018) who said that Islamic values must be applied in learning to get good character improvement. However, teachers in pesantren-based schools are only able to integrate Islamic values in some mathematics materials.

Table 3. Problems in implementing the school's vision and mission related to learning mathematics integrated with Islamic values

Data	Theme
The gap between the implementation of learning and the school's vision and mission.	Commitment of school staff

The vision and mission of pesantren-based schools include the desire to integrate learning and Islamic values. However, in its implementation, there are many obstacles so that the vision and mission are not achieved optimally. This is related to the efforts of school staff in fighting for the vision and mission of the school. In line with the opinion of Nuning (2014), which states that the achievement of the school's vision and mission is based on the roles taken by the principal and the entire community. The principal plays a role in managing the educational environment to improve the quality of education in schools (Faliyandra et al, 2021). A principal can provide supervision and correction to other school staff so that the achievement of the school's vision and mission is more directed. However, this is not done in pesantren-based schools so the learning process is less able to achieve the final results by the vision and mission of the school.

Conclusion

This study produces findings related to the application of Islamic value integration in mathematics learning in pesantren-based schools, namely: (1) integrating Islamic values in

mathematics learning is considered important; (2) teachers experience various obstacles in the planning process of integrating Islamic values in mathematics learning so that teachers are less capable in the implementation process; (3) despite experiencing various obstacles, teachers try to apply Islamic values in mathematics learning in some materials, for example in the material of opportunities and derivatives; (4) guidance is needed for teachers to be able to integrate Islamic values in mathematics learning.

Based on these findings, the researcher suggests that pesantren-based schools should develop learning plans for general sciences, especially mathematics, which are integrated with Islamic values in each material and provide guidance to teachers to increase knowledge about how to integrate Islamic values in mathematics learning. This is one of the efforts so that the objectives of the pesantren-based school itself can be realized.

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