

Research Article

Developing Students' Character Through the Integration of Islamic Values in Mathematics Learning

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ABSTRACT

This research aims to analyze the role of the integration of Islamic values in mathematics learning on the formation of students' character. Through a literature study approach, this research highlights how values such as honesty, justice, responsibility, hard work, and awareness of the greatness of God can be applied contextually in the mathematics learning process. The results of the study show that the integration of these values not only improves students' academic understanding, but also strengthens their moral and spiritual aspects. Mathematics learning based on Islamic values is able to foster the character of students who are religious, honest, disciplined, and able to work together. However, there are challenges in implementation, such as limited time, lack of teacher training, and the absence of a systematic learning model. Therefore, it is necessary to develop a curriculum and learning strategies that are able to accommodate the incorporation of Islamic values in mathematics education effectively.

Keywords: Character Education; Islamic Values; Mathematics Learning; Value Integration; Students

1. INTRODUCTION

Character education is one of the important aspects of the education system in Indonesia, especially in the context of Islamic education. In this context, mathematics education not only serves as a tool to master mathematical concepts, but also as a medium to shape students' character. This research focuses on how Islamic values can be applied in mathematics learning to have a positive impact on students' character. According to the National Education System Law No. 20 of 2003, education must develop the full potential of students, including moral and spiritual aspects (Ministry of Education and Culture, 2003). In the context of Islamic education, the integration of Islamic values in mathematics learning is an effective strategy to form the character of students with noble character (Laila Shofia & Putri Nur Malasari, 2023).

Research by (Ariningsih & Amalia, 2020) It shows that mathematics learning that integrates with Islamic values can shape students' character through relevant teaching materials, so that students not only have intellectual intelligence but also spiritual intelligence. (Dermawan & Prasetyo, 2024) adding that values such as honesty, justice, responsibility, and hard work can be integrated in mathematics learning through contextual approaches and inspirational stories from Islamic history, which not only make learning more engaging but also strengthen students' Islamic identity as well as increase their motivation to learn. Further (Rahayu et al., 2024) emphasizing that the integration of Islamic values in mathematics learning can help students understand the greatness of Allah through mathematical materials, improve understanding of mathematical concepts and Islamic values, and form a qualified person. (Faizah et al., 2023) also highlighted that mathematics learning that is oriented towards moral values can shape students' character through the development of student worksheets (LKPD) that are integrated with Islamic values, which are effective in improving students' character such as honesty, responsibility, and hard work. Thus, the integration of Islamic values in mathematics learning not only enriches the educational process but also makes a significant contribution to the formation of the character of students with noble character, in accordance with the goals of Indonesia's national education.

The integration of Islamic values in mathematics learning is an approach that is increasingly developing in the world of education, especially in Islamic-based schools. The goal is to form the character of students who are not only academically intelligent, but also have noble morals according to Islamic teachings (Aviola et al., 2023). Islamic values that can be

integrated in mathematics learning include (1) Honesty (shidiq), the value of honesty can be instilled through mathematics learning by emphasizing the importance of honesty in the process of working on problems and reporting results. (Shofia) Fostering confidence, responsibility, fairness, honesty, and consistency towards the rules are all good things about math concepts. (2) Fair, the concept of justice can be integrated in mathematics learning through examples of problems that reflect the principle of justice. For example, in linear equation material, teachers can use the context of fair division (Faadhilah et al., 2024) The values of justice and social care encourage the creation of an inclusive and collaborative learning environment. (3) Responsibility (amanah), instilling the value of responsibility in mathematics learning can be done by giving tasks that require students to complete them earnestly and on time. (4) Perseverance and hard work, Mathematics as a science that requires practice and deep understanding can be a means to instill the value of perseverance and hard work. (5) Awareness of the greatness of Allah (tafakur), The learning of mathematics can also be directed to cultivate awareness of the greatness of Allah through reflection on the order and beauty of the universe that can be explained mathematically. (Ridha et al., 2024) Incorporating Islamic values into mathematics education is important to enrich students' learning experiences and understand the greatness of Allah through mathematics materials.

The integration of Islamic values in mathematics learning can be done through an approach that combines mathematical concepts with Islamic teachings. For example, the use of stories or analogies related to Islamic values can help students understand mathematical concepts while instilling moral values. Research shows that this approach is effective in forming the character of students who are religious, honest, disciplined, and responsible (Rahmawati et al., 2024; Suparni, 2011). Character education based on Islamic values can also strengthen students' identities as individuals with noble character. Through learning that emphasizes values such as honesty and responsibility, students are taught to become individuals who are not only intellectually intelligent, but also have high moral integrity.

The integration of character values in mathematics learning can also be done through a problem-based learning approach. In this approach, students are invited to work together in solving real problems, which encourages them to communicate effectively, respect the opinions of others, and work in teams. This is in line with research findings that show that problem-based learning can develop an attitude of mutual respect and responsibility among students. (Pujiastuti & Suyitno, 2016) Thus, integrating the value of mutual respect in mathematics learning not only enriches students' learning experience, but also shapes them into more empathetic, tolerant, and willing individuals to contribute in a diverse society. However, the challenge faced in mathematics education is how to present moral values in a more practical and relevant context. Many teachers may find it difficult to relate abstract mathematical concepts to more concrete Islamic values. Therefore, the right approach in teaching math is essential. One way that can be done is to relate mathematics material to students' daily lives. For example, the use of real-world examples in calculations, such as calculating zakat or the distribution of inheritance, can provide more meaningful context for students.

One of the studies by (Safitri et al., 2020) revealed that most mathematics teachers have not designed learning tools that systematically integrate Islamic values. Some teachers only insert these values spontaneously without careful planning. The main obstacles faced include limited time in compiling learning tools and difficulties in relating mathematics materials to relevant Islamic contexts. In addition, teachers are also concerned that improper integration can lead to a misunderstanding of mathematical concepts and Islamic values. Through the right approach, teachers can create a learning environment that focuses not only on academic achievement, but also on the formation of students' character. Teachers who are able to relate the material to Islamic values will be more successful in educating students holistically. In this case, teachers not only play the role of teachers, but also role models for students. The example of teachers in applying Islamic values in daily life greatly affects the way students absorb and internalize these values. In addition, the use of technology in learning can also be a tool to integrate Islamic values. By utilizing educational apps that teach math as well as moral values, students can learn in a more interactive and fun way. For example, an app that features inspirational stories from Islamic figures that prioritize the values of honesty and responsibility in the context of mathematics can provide inspiration for students. More broadly, the application of Islamic values in mathematics education can also contribute to the formation of a better society. When students are equipped with good character, they will grow into responsible individuals who care about the surrounding environment. This is in line with the goal of national education which wants to create a generation that is not only academically intelligent, but also has good morals and ethics.

This research aims to analyze the application of Islamic values in mathematics education and its impact on changes in students' character. By understanding how these values can be integrated in learning, it is hoped that they can make a positive contribution to the development of students' character. Along with the development of the times and the challenges faced by education in Indonesia, it is important to continue to look for innovative ways to teach Islamic values through mathematics education.

2. RESEARCH METHOD

The library research method is a scientific approach that utilizes written sources as the main data in the research process. These sources include books, scientific journals, articles, official documents, and a variety of other literature relevant to the topic being researched. This method aims to study, analyze, and synthesize available information in order to build theoretical foundations, identify knowledge gaps, and formulate a solid conceptual framework. According to (Haryono et al., 2024), literature research emphasizes the collection of in-depth information from various literature such as books, notes, magazines, journals, and supporting documents without the need for field research. This research is a study of the text that is the main element. Data collection techniques in literature research can be done through documentation, namely by looking for data about things or variables in the form of notes, transcripts, books, magazines, minutes, and so on. This approach allows researchers to examine and analyze various existing sources of information to gain a deeper understanding of the topic being researched. (Abdurrahman, 2024) added that literature research has characteristics as qualitative, descriptive, non-field research, and emphasizes the role of researchers in data analysis. This type of research can be classified based on objectives and types of data, such as historical, descriptive, explanatory, evaluative, philosophical, or comparative research. The stages in literature research generally include: 1) Determination of the research topic, 2) Exploration of information and topic feasibility, 3) Determination of the focus of the research, 4) Collection of primary and secondary data sources, 4) Data analysis and reference sources, 6) Creation and processing of research records and 7) Preparation of research reports. In the context of this study, the data sources used include primary and secondary sources. Primary sources include original literature such as books, journal articles, and official documents, while secondary sources include reviews, summaries, or interpretations of primary sources. The data analysis technique used is content analysis, which aims to identify and interpret the meaning of the analyzed text. This analysis allows researchers to reveal patterns, themes, and relationships between concepts in the literature studied.

3. RESULTS AND DISCUSSION

3.1 The Importance of Character Education in Mathematics Education

Character education is a fundamental aspect of education that aims to shape the personality of students. In the context of mathematics education, character education is very important because it can help students not only in understanding mathematical concepts, but also in developing positive attitudes and behaviors. Recent research by (Febrian & Darmawan, 2025) shows that character education has a significant impact on improving the academic achievement of junior high school students. The cultivation of good character education is carried out through collaboration between parents and teachers, creating an environment that supports the development of students' character. Strong character, formed by internal drive and external support, influences students' attitudes and behaviors in the learning process. The results of the study show that with effective character education management, students become more engaged, passionate, and productive in achieving their educational goals.

In mathematics learning, the integration of character education can be done through various approaches. For example, the use of cooperative learning models can instill values such as cooperation, responsibility, and never giving up. Research by (Laila Shofia & Putri Nur Malasari, 2023) in MAN Model Banda Aceh shows that the integration of character education in mathematics learning is carried out from the planning, implementation, to evaluation stages, by instilling values such as religious, discipline, honesty, and high curiosity. Furthermore, research by (Rizkiyah & Hidayat, 2023) in Madrasah Ibtidaiyah shows that characters such as religiousness, discipline, tolerance, and responsibility can be integrated in mathematics learning through students' daily activities. This shows that character education is not only important in the academic context, but also in shaping individuals who have strong moral values.

Mathematics education that focuses only on mastery of the material often ignores the moral and ethical aspects. This can result in students losing orientation in learning, which in turn can negatively impact their character. Therefore, the integration of Islamic values in mathematics education is very relevant. For example, in mathematics learning, teachers can relate the concept of honesty to the importance of honesty in doing exam questions. Recent research shows that the integration of Islamic values in mathematics learning not only enriches students' conceptual understanding, but also contributes significantly to the formation of positive character. According to (Dermawan & Prasetyo, 2020) Values such as honesty, justice, responsibility, and hard work can be integrated through contextual approaches and inspirational stories from Islamic history, which increase students' motivation to learn and strengthen students' Islamic identity.

Further (Fitrah & Kusnadi, 2022) emphasizing that the incorporation of Islamic values in mathematics learning can be done by inserting relevant verses of the Qur'an, associating mathematical concepts with Islamic principles, and using

learning strategies that foster honesty, consistency, fairness, and responsibility. The implementation of this integration has also proven to be effective in improving the character of students at the junior high school level. (Suhandri & Syahwela, 2024) Develop valid, practical, and effective Islamic integrated mathematics teaching materials, which are able to foster students' character such as obedience to rules, justice, and honesty. Thus, the integration of Islamic values in mathematics learning not only enriches the cognitive aspect, but also plays an important role in shaping the character of students with noble character. This is in line with the goals of Indonesia's national education which emphasizes the development of students' potential to become individuals of faith, piety, and noble character.

Statistics show that students who engage in character education programs have higher levels of honesty. A study by Futihat showed that through the group learning approach, students' honesty levels increased from 63.75% in the first cycle to 100% in the third cycle. This shows that this method is effective in instilling the value of honesty among students. This shows that character education can have a significant impact on students' attitudes. Thus, mathematics education that integrates Islamic values can be an effective tool to shape students' character.

3.2 The Importance of Character Education in Mathematics Education

3.2.1 Honesty

Honesty, or in Arabic known as *shidiq*, is one of the most important moral values in life. In the context of education, especially in mathematics learning, honesty can be a strong foundation for building students' character. Learning math is often considered a rigid process and focuses only on numbers and formulas. However, if we look deeper, mathematics is all about problem-solving, logic, and decision-making. In every step taken, honesty plays an important role. For example, when students solve math problems, they are faced with the choice of solving problems in an honest way or by cheating. In this context, teaching about honesty not only serves to build character, but also to improve students' critical thinking skills. Recent studies (female) show that complex mathematical problem solving requires significant critical thinking skill contributions, which include the ability to recognize situations that require critical thinking and avoid errors in problem formulation.

One way to instill the value of honesty in mathematics learning is to emphasize the importance of the process of working on the problem. In many cases, students tend to focus on the final outcome without paying attention to how they arrived at those outcomes. This can cause students to take shortcuts, such as cheating or using unauthorized tools. Therefore, it is important for educators to teach that the process of working on the question is just as important as the final result. Thus, students will learn to value effort and integrity in every step they take. (Hidayati) the measurement of honest character in mathematics learning using the right instruments is very helpful for teachers in assessing the affective aspects of students accurately and accountably.

Concrete examples of the application of honesty values in mathematics learning can be seen in group activities. When students work in groups to solve problems, they should communicate with each other and share thoughts. In this situation, honesty is key to ensuring that each member of the group makes a fair contribution and does not hide information. This not only helps students understand the material better, but also builds a sense of responsibility and trust between them. Studies (sofroniou) show that group work allows students to develop a wide range of critical, analytical, and communication skills; effective teamwork; as well as appreciation and respect for other people's views, techniques, and problem-solving methods, all of which encourage active learning and improve student learning outcomes.

Next, we need to consider how reporting results can also reflect the value of honesty. In this context, students should be taught to report their work honestly, regardless of whether the results are satisfactory or not. For example, if a student gets a low grade on a math test, it's important for them to understand that reporting those grades honestly is part of the learning process. This way, students will learn to accept failure as part of their journey and not feel pressured to pretend to have better outcomes. Research (Pandan & Lomibao, 2022) Demonstrate that all stakeholders must be committed to evaluating student learning in an authentic and honest manner, as well as confronting challenges and difficulties in learning assessment practices.

In addition, it is important to foster students' confidence in the context of honesty. Confident students are more likely to admit mistakes and learn from their experiences. In math learning, this can be achieved by providing constructive feedback and creating a supportive environment. When students feel safe to share their mistakes without fear of being judged, they will be more open to learning and applying the value of honesty in their daily lives. Integrating moral values in mathematics learning can also be done through the use of real-life examples. For example, teachers can use real-life situations that involve mathematical decisions, such as budget calculations or data analysis. In this context, students will learn that honesty does not only apply in academic contexts, but also in everyday life. By relating math learning to real-life situations,

students can see the relevance of honesty values and how it can influence their decisions in the future. Transitioning from one topic to another in math learning can also reflect the value of honesty. For example, when discussing a new topic, teachers can remind students of the importance of honesty in the learning process. In this way, students will be constantly reminded to apply those values in every aspect of their learning. This creates a continuity between the value of honesty and broader math learning.

In an in-depth analysis of honesty in math learning, we also need to consider the challenges that students may face. In a competitive environment, there is pressure to achieve good results, which can cause students to feel compelled to be dishonest. Therefore, it is important for educators to create a culture that emphasizes the learning process rather than just the end result. This way, students will feel more comfortable taking risks in their learning and more likely to behave honestly. In a global context, honesty in education also has a broader impact. In today's information age, where access to data and information is easy, it is important for students to develop the ability to evaluate information honestly. In math learning, this can be achieved by teaching students to critically analyze data and make decisions based on facts and evidence. In this way, students not only learn math, but also important life skills.

In conclusion, we can conclude that the value of honesty has a very important role in learning mathematics. Through the process of working on questions, reporting results, and developing confidence, students can learn to value integrity and responsibility. By integrating moral values in the curriculum, we not only build students' character, but also improve their ability to think critically and make wise decisions. Therefore, it is important for educators to continue to look for ways to instill the value of honesty in every aspect of learning, so that students can grow into individuals who are not only academically intelligent, but also have high integrity.

3.2.2 Fair

Justice in Islam is not just about giving everyone rights, but also putting things in their proper proportions. In the context of mathematics learning, this value is reflected in providing an equal opportunity for every student to understand concepts and develop skills. A fair teacher will ensure that teaching methods, learning resources, and assessments are unbiased and accommodate students' diverse learning styles and levels of understanding. For example, in assigning assignments, teachers can consider the level of difficulty that suits each student's abilities, or provide additional help for those who are having difficulties without giving preference to others. This is in line with the principle of justice that emphasizes balance and proportionality in all aspects.

Furthermore, fairness in mathematics can also be seen from objectivity and precision in calculation and reasoning. Mathematics as a science definitely demands intellectual honesty and avoids data manipulation or subjective interpretation. When students learn math, they are indirectly trained to think logically, systematically, and based on accurate facts. The process of proof in mathematics, for example, teaches students to draw valid conclusions based on clear and unambiguous premises. Thus, mathematics learning can instill the value of fairness in thinking and acting, where decisions are made based on objective analysis and avoiding prejudice. The relevance of "fair" values in mathematics learning can also be strengthened through the context of questions or case studies that are relevant to social justice issues. For example, questions involving the equitable distribution of resources, the calculation of zakat and inheritance from an Islamic perspective, or the analysis of statistical data on social inequality can be a means to integrate these Islamic values. The use of social context (story problems that touch on the social life aspect) in mathematics learning not only increases understanding of concepts, but also fosters students' awareness of the values of justice and social concern. Thus, mathematics learning that integrates "fair" grades can form students who are not only competent in mathematics, but also have high moral and social awareness.

Research in mathematics learning can be felt in geometry learning, teachers can explain the importance of justice and equality in measurement and calculation. This is in line with the principles of justice in Islam which teach that every individual should be treated fairly (As-siyah et al., 2024). In addition, the nature of justice can be shown in the law of constraint of an equation, where to eliminate a value on the left segment, the right segment is also added or subtracted by the same number (Fitrah & Kusnadi, 2022).

3.2.3. Responsibilities

The value of responsibility plays a crucial role in learning mathematics, a discipline that requires perseverance, rigor, and deep understanding. Responsibility in this context goes beyond just completing tasks, but also includes seriousness in understanding concepts, honesty in the learning process, and discipline in managing time and effort. A responsible attitude encourages students to be active in the learning process, find solutions to the difficulties they face, and not give up easily. This is in line with Islamic values that emphasize itqan (seriousness) in all actions, including in seeking knowledge.

Furthermore, responsibility in mathematics learning is also reflected in the ability to collaborate and help each other with peers. Group discussions and the exchange of ideas in solving math problems can foster a sense of collective responsibility and enrich the understanding of each individual. This value is in line with the principle of *ta'awun 'alal birri wat-taqwa* (helping in kindness and piety) in Islam.

Recent research in mathematics education continues to highlight the importance of developing student responsibility. The development of student responsibility in mathematics learning through self-assessment mechanisms and peer feedback fosters a deeper understanding of concepts and encourages independent learning (Silvatama et al., 2023). This suggests that learning strategies that empower students to reflect on their learning and provide feedback to peers can increase their sense of responsibility for the learning process.

3.2.4 The Value of Perseverance and Hard Work

In the world of education, especially in mathematics learning, the value of perseverance and hard work are the two main pillars that support student success. In the context of Islam, these values are highly recommended and are part of the teachings that must be applied in daily life. In the Qur'an, Allah SWT says, "*And say: 'Work for yourselves, and Allah and His Messenger and the believers will see your work...'*" (QS. At-Taubah: 105). This shows how important hard work is in every aspect of life, including in learning math. In this context, students who are persistent and diligent in learning mathematics will not only gain a better understanding, but will also be rewarded for their efforts.

Statistics show that students who have high perseverance tend to have better academic achievement. According to research conducted by (Permatasari et al., 2024) Perseverance or "grit" is positively related to academic achievement. In mathematics learning, perseverance can be interpreted as the ability to keep trying despite facing difficulties. For example, a student who faces difficulty in understanding algebraic concepts, but still strives to learn and seek help, will be more likely to succeed compared to a student who gives up halfway through. In the context of Islam, this is in line with the teachings of the Prophet Muhammad PBUH who encouraged his people not to despair easily and continue to strive to achieve goals. Hard work in learning mathematics can also be seen from real-life case examples. In Indonesia, there are many students who have achieved achievements in the field of mathematics thanks to their perseverance and hard work. For example, in the mathematics olympiad competition, many participants come from backgrounds that are not always supportive, but with maximum effort, they are able to compete at the national and even international levels. Data from the Ministry of Education and Culture of the Republic of Indonesia show that students who take a mathematics coaching program and receive intensive tutoring show a significant increase in their test scores. This shows that with hard work and perseverance, good results can be achieved, in accordance with Islamic principles that encourage its people to strive earnestly.

Finally, the value of perseverance and hard work in learning mathematics is not only beneficial for achieving academic achievement, but also shapes the character of students. In Islam, good character is highly valued and is part of the personality of a Muslim. Perseverance and hard work teach students not to give up easily, face challenges with their heads held high, and always try to give their best. This is in line with Islamic values that teach its people to always try and not give up. Thus, learning mathematics is not only about numbers and formulas, but also about how to form strong and resilient characters, which will be useful in everyday life.

3.2.5 Awareness of the Greatness of Allah (Tafakur)

Mathematics is often considered a neutral and exact science. However, from an Islamic perspective, mathematics is a form of manifestation of the greatness of Allah SWT which is reflected in the order, balance, and logic of the universe. *Tafakur*—contemplating Allah's creation—can be done by realizing that every mathematical concept such as numbers, patterns, and geometry is part of *sunnatullah*, the laws that He created to govern the universe. As Allah SWT says: "*Indeed, in the creation of the heavens and the earth, and the change of night and day, there are signs for the righteous*" (QS. Ali Imran: 190), mathematics is a reflective means of knowing God through the miracle of His system.

In learning, teachers can instill spiritual awareness in students by associating mathematical concepts with monotheistic values. For example, the regularity in the pattern of numbers shows the nature of the Most Orderly God (*Al-Muqtadir*), or the concept of symmetry and proportion reflecting the beauty of Allah's Most Beautiful creation (*Al-Jamil*). This is in line with the findings (Shah & Fathurohman, 2025), which emphasizes the importance of integrating *Islamic worldview* in every aspect of mathematics learning to foster students' spiritual awareness. Further (Isnawati et al., 2025) In his article, he suggests a contextual approach based on *kauniyah* verses. Thus, students not only understand formulas and numbers technically, but also reflect on how all the laws are not randomly present, but are neatly arranged by the Creator. This thought process is a form of *Scientific Tafakur* which involves rational as well as spiritual intelligence, strengthening

students' relationship with God through the miracle of science. By getting used to tafakur in mathematics learning, education not only produces academically intelligent individuals, but also character and faith. Students are invited not only to calculate and memorize formulas, but also to contemplate, admire, and praise the greatness of God through logic and the beauty of mathematics. This approach makes learning a meaningful process and fosters a sense of awe and gratitude to Him.

3.3 The Impact of the Application of Islamic Values on Students' Character

The application of Islamic values in mathematics education has shown a significant and positive impact on the formation of students' character. The integration of these values includes honesty in arithmetic, precision in solving problems, and instilling awareness that mathematics is a tool to understand the order of God's created nature (Putri & Ali Akbar, 2024). This approach goes beyond just mastering formulas, but builds the foundation of noble morals. One of the most tangible results is an increase in mutual respect and the ability to work together among students (Lubis et al., 2024). When the learning process of mathematics is based on values such as ta'awun (help in kindness) and appreciation for Ukhuwah (brotherhood), students are invited to see differences in ways of solving problems as diversity that enriches, not divisive competition.

Furthermore, the emphasis on group cooperation to solve math problems, framed in the spirit of helping each other for God's sake, effectively fosters vital social skills. Students learn to listen to the ideas of others, make constructive contributions, and work together to find the best solutions, as supported by recent research on the integration of values in learning (Apriliansa et al., 2025; Lubis et al., 2024). This ability, namely respecting different opinions and working together productively, is an important foundation for the development of harmonious and adaptive students' character, preparing them to interact positively in a pluralistic society, in accordance with Islamic teachings on the importance of maintaining good relations with fellow humans. One of the case studies (Usman, 2024) The "Noble Character" program shows that the students involved in it experience an increase in positive attitudes, such as being able to control themselves more and showing mutual respect. Further, the program not only succeeds in building individual character but also "promotes a positive climate in the school environment as a whole." This is in line with the statement that moral values-focused education creates a positive learning environment.

3.4 Challenges in Integrating Islamic Values in Mathematics Education

Although the integration of Islamic values in mathematics education has many benefits, there are several challenges that need to be faced. One of the main challenges is the lack of understanding and awareness from teachers about the importance of character education based on Islamic values. Many teachers still focus on the academic aspect without realizing that character education is also very important (Zulkarnain, 2019). Most teachers do not have a strong conceptual or methodological foundation to connect the concept of mathematics with Islamic values that are spiritual and ethical. As a result, this integration is often done artificially, for example by simply adding verses of the Qur'an without deep meaning or logical connection to the mathematical material being taught. The integration of Islamic values in mathematics learning is often considered difficult because teachers are not used to applying it. Therefore, there is a need for professional training and coaching specifically designed to support teachers' ability to harmonize Islamic teachings with logical and abstract concepts in mathematics.

In addition, the existing educational curriculum often does not provide enough space to integrate Islamic values. A lot of material has to be taught in a limited amount of time, so teachers may find it difficult to insert moral values in learning. Therefore, there is a need for a curriculum revision that allows the integration of Islamic values in all subjects, including mathematics. The absence of a concrete integration model or guidance is also a major obstacle. Without a practical and standardized teaching model, teachers tend to experience confusion in applying Islamic values contextually in mathematics. For example, there are not many modules available that show how mathematical concepts can be linked to the value of patience or order in Islam. This creates a gap between the idealism of the goal of Islamic education and the reality of classroom learning. The lack of pedagogical understanding of teachers and limited contextual implementation guidelines are the main challenges in integrating Islamic values in mathematical learning. This shows that it is necessary to develop learning models that are concrete and can be replicated by teachers at various levels of education units.

Another challenge is the difference of views among the community and even within the educational institution itself towards the application of Islamic values in exact subjects such as mathematics. Some people still think that religion should be limited to special subjects such as Islamic Religious Education (PAI), while other subjects are quite focused on cognitive and logical aspects. As a result, the integration of Islamic values is often perceived as irrelevant or even forced, and the difference in public views on the extent to which religious values should be applied in formal education becomes a significant

obstacle (Squirrels, 2024). This view creates quite serious socio-cultural challenges, which, if not responded to with a dialogical and educational approach, can hinder efforts to integrate Islamic values as a whole in the education system.

4. CONCLUSION

This study concludes that the integration of Islamic values in mathematics learning plays a significant role in shaping the character of students with noble character. Values such as honesty (*shidiq*), justice (*'adl*), responsibility (*amanah*), hard work and perseverance, and awareness of the greatness of Allah (*tafakur*) can be applied contextually in mathematics materials to strengthen students' character education. Learning mathematics colored by Islamic values not only improves academic understanding, but also develops the moral and spiritual dimensions of students, such as fostering a sense of responsibility in tasks, honesty when working on problems, and empathy and cooperation in group work. This approach strengthens students' Islamic identity and creates a religious, reflective, and meaningful learning atmosphere. However, there are challenges in implementation, such as a lack of teachers' understanding of integrative methods, limited time and learning tools, and a curriculum that does not fully support the incorporation of moral and academic aspects. Therefore, teacher training, the development of integrated teaching materials, and education policies that support this approach are needed. Overall, mathematics learning that integrates Islamic values becomes a strategic and relevant alternative to form the character of students who are not only intellectually intelligent, but also morally and spiritually superior, in line with Indonesia's national education goals.

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