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Scientific Horizon: Basis for Developing Basic Mathematics Teaching Materials

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Abstract

This study explores the development and validation of mathematics teaching materials that integrate Islamic values to foster both cognitive and ethical growth in students. Utilizing the scientific horizon model, these materials were designed to connect mathematical concepts with Islamic teachings, making learning relevant to students' cultural and spiritual backgrounds. The development followed the Plomp model, with five stages: initial investigation, design, development, evaluation, and dissemination. Expert validation rated the materials as "valid" (average score of 4.09), affirming their educational rigor and cultural appropriateness. Field trials with 50 first-semester students from the Mathematics Education Study Program at the State Islamic University of Mataram showed high student engagement, with over 90% expressing positive responses. Students reported that the contextualized lessons—such as using modular arithmetic to calculate prayer cycles and exploring infinity through Qur'anic reflections—enhanced their understanding and engagement. This study demonstrates that integrating Islamic values into mathematics not only aids in comprehension but also promotes ethical reflection, supporting the holistic educational mission of Islamic institutions. Recommendations for future research include broader implementation across educational contexts and expansion into other STEM subjects.

Keywords: Islamic values, mathematics education, scientific horizon model, curriculum development, student engagement

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INTRODUCTION

In the field of mathematics education, integrating mathematical instruction with dimensions of social, religious, and cultural values is gaining recognition as a means to create more meaningful and engaging learning experiences. Such integration is particularly relevant in diverse cultural and religious settings, where educational goals often extend beyond purely cognitive development to include moral and ethical growth (Inci et al., 2023). Realistic Mathematics Education (RME), pioneered by Hans Freudenthal in the 1970s, forms the foundation for these integrative approaches. Freudenthal proposed RME as a reaction to traditional, abstracted mathematics instruction, asserting that mathematics should be a human-centered activity with direct relevance to real-life issues (Freudenthal, 1968). His approach emphasizes mathematics as a tool for problem-solving in daily life, fostering connections between mathematical theory and practical applications. In this way, culturally contextualized mathematics instruction does not merely serve to convey abstract concepts; rather, it enables students to find personal and social significance in their learning (Van den Heuvel-Panhuizen & Drijvers, 2020; Rusbult & Van Lange, 2003).

The integration of Islamic values into mathematics education at institutions like the State Islamic University of Mataram offers an opportunity to create a curriculum that resonates with students' identities and experiences. By doing so, mathematics education becomes a means to connect academic knowledge with moral and ethical values, supporting the development of well-rounded individuals prepared for both professional success and ethical citizenship. This study therefore examines the potential of integrating Islamic values within mathematics education, addressing a recognized need for educational approaches that honor both intellectual and spiritual development.

The integration of values in education is supported by several key educational theories that emphasize the role of culture, social context, and personal engagement in learning. One of the primary frameworks supporting this integration is Realistic Mathematics Education (RME). RME challenges traditional approaches by advocating for mathematics as a discipline deeply embedded in societal and cultural practices, rather than as a collection of abstract symbols and rules. According to RME, students should encounter mathematics in contexts that are meaningful and familiar to them, allowing them to actively construct mathematical understanding through real-world applications (Van den Heuvel-Panhuizen & Drijvers, 2020). For example, students may explore mathematical concepts by solving problems related to daily life, community issues, or religious practices, thus developing a practical understanding of mathematics that is directly relevant to their lives.

This view aligns with constructivist theories, which propose that learners actively build knowledge through engagement with meaningful contexts. Jerome Bruner, a prominent figure in educational psychology, argued that knowledge construction is most effective when students can create their own representations of mathematical concepts, linking new knowledge to their existing cultural and cognitive frameworks (Bell, 1981; Ruseffendi, 1988). This approach is particularly relevant in the integration of Islamic values, as it allows students to contextualize mathematics within a framework of beliefs and ethical principles that are familiar and significant to them. Additionally, Vygotsky's social constructivism emphasizes that learning is a collaborative process shaped by interactions within cultural and social contexts (Steffe et al., 1996; Berger, 2005). According to Vygotsky, the meanings and applications of mathematical concepts are not merely transmitted from teacher to student but are co-constructed through dialogue and shared experiences within a learner's community.

Building on these constructivist principles, the integration of Islamic values in mathematics can provide students with a foundation for both cognitive and moral development. For example, presenting mathematical problems that incorporate themes from Islamic teachings, such as fairness, balance, or resource distribution, allows students to explore mathematical concepts while engaging with ethical considerations rooted in their cultural and religious beliefs. This approach situates mathematical learning within a broader context of personal and community values, supporting students in developing a deeper understanding of mathematics as a dynamic, human-centered discipline.

Integrating Islamic educational principles in mathematics education addresses the need for curriculum reforms that promote ethical, moral, and social development alongside traditional academic goals (Sumarni et al., 2020; Nasarudin, 2014). Research suggests that when students see their cultural and religious identities reflected in their learning experiences, they are more likely to feel a sense of belonging and motivation in the classroom (Bolger & Ecklund, 2018). This sense of connection fosters deeper engagement and encourages students to view mathematics not merely as an abstract subject but as a discipline that is relevant to their lives and personal beliefs.

Incorporating Islamic values into mathematics education has the potential to transform students' perceptions of mathematics, making it a tool for personal growth and ethical reflection. For example, lessons that include concepts of fairness and accountability, themes commonly emphasized in Islamic teachings, can help students approach mathematical problems with an ethical mindset. This value-based approach to mathematics education not

only enhances cognitive engagement but also supports the development of critical thinking and ethical reasoning skills. By linking mathematical learning to personal values, students develop a comprehensive understanding of mathematics that includes not only its intellectual but also its moral dimensions (Maarif, 2015).

The Mathematics Education Study Program at the State Islamic University of Mataram has embraced the mission of integrating Islamic principles within the academic curriculum to bridge religious and secular knowledge. This study aligns with the university's vision by developing validated and practical teaching materials that integrate Islamic values into basic mathematics instruction. Drawing from the university's "scientific horizon" framework, which encourages the unification of religious and academic knowledge, this research seeks to develop instructional resources that enable educators to convey both cognitive and moral lessons through mathematics. Although the integration of religious values in STEM education is supported by existing theoretical models, practical approaches remain limited in Islamic educational contexts. This study addresses this gap by creating, validating, and evaluating Islamic value-based teaching materials, aiming to provide an educational model that supports the cognitive and ethical development of students in a structured, accessible way.

The "scientific horizon" framework employed by the State Islamic University of Mataram is based on the educational philosophy of Ki Hajar Dewantara, who advocated for the balanced development of intellectual, physical, and spiritual faculties. Dewantara's concept of holistic education emphasizes the cultivation of "complete human beings" characterized by universality, freedom, and dignity, a vision that aligns with the integration of Islamic values into mathematics (Tilaar, 2006). The scientific horizon framework seeks to operationalize Dewantara's philosophy by fostering an educational environment where mathematics is not solely an academic subject but also a means for students to explore ethical and spiritual dimensions of knowledge.

In implementing this model, the university seeks to encourage students to perceive mathematics as interconnected with Islamic teachings, thereby facilitating the development of an academic and spiritual identity that aligns with their religious values. However, implementing a curriculum that integrates both secular and religious principles presents unique challenges, particularly in terms of balancing cognitive objectives with ethical content. To address these challenges, this study's approach emphasizes the structured integration of Islamic principles in a manner that maintains the academic rigor of mathematics while enriching it with ethical and moral perspectives.

Efforts to integrate cultural and religious values in STEM education have demonstrated various benefits, including enhanced engagement, improved moral reasoning, and greater relevance of the subject matter for students from diverse backgrounds. Research indicates that when students' cultural identities are represented in the curriculum, they are more likely to engage in the subject matter meaningfully, develop a positive academic identity, and feel a sense of belonging in the learning environment (Asiyah et al., 2023; Bolger & Ecklund, 2018). For example, studies on culturally responsive teaching in STEM have shown that embedding culturally relevant examples and ethical discussions in the curriculum fosters greater student interest, particularly among underrepresented groups.

In the context of Islamic education, the integration of religious principles in STEM has been explored through various models, such as the "Islamization of science." This approach, as articulated by Umar and Sukarno, emphasizes aligning scientific inquiry with Islamic values to create a curriculum that incorporates both scientific rigor and spiritual awareness (Umar & Sukarno, 2022). By developing a curriculum that reflects both secular and religious knowledge, educators can support students in developing a holistic understanding of scientific concepts and ethical considerations.

Research by Warapsari (2023) highlights additional benefits of integrating religious values in science education, illustrating how religious and scientific content can be combined to reinforce students' understanding of both domains. Similarly, studies by Purwati et al. (2018)

indicate that incorporating Islamic values in science education positively impacts students' moral development and encourages them to view scientific knowledge as interconnected with ethical responsibility toward society and the environment. These findings underscore the potential of value-based education to foster critical thinking, ethical reasoning, and responsible citizenship.

The development of Islamic value-based teaching materials in mathematics education has far-reaching implications for creating a comprehensive educational framework that addresses students' cognitive, ethical, and spiritual development. This study's findings are intended to contribute to the broader discourse on value-based STEM education, highlighting the role of cultural and religious principles in supporting holistic learning. By integrating Islamic values into mathematics instruction, the study aims to produce materials that not only support students' understanding of mathematical concepts but also foster a sense of ethical responsibility. Such an approach has the potential to influence curriculum design within other Islamic educational institutions, encouraging the adoption of pedagogical practices that respect and reflect students' cultural and religious identities.

The implications of this research extend beyond individual classrooms. The study contributes to the ongoing discourse on the role of values in STEM education, particularly within culturally diverse and religiously affiliated institutions. By addressing both intellectual and ethical dimensions of learning, the study promotes a comprehensive model for STEM education that acknowledges the importance of personal identity and values in the learning process. Furthermore, the findings may inform broader policy discussions within Islamic educational institutions, supporting the development of curricula that integrate academic excellence with spiritual growth.

The integration of Islamic principles within mathematics education represents a meaningful step toward realizing the State Islamic University of Mataram's vision of holistic education. Through the scientific horizon framework, this study offers a structured approach for incorporating Islamic values into mathematics teaching, addressing the dual objectives of academic and moral development. By creating validated, practical teaching materials that support both cognitive and ethical learning outcomes, this research seeks to bridge the gap between secular and religious knowledge in a way that resonates with students' cultural and spiritual identities. This integrative approach aligns with broader efforts to make STEM education more inclusive and responsive to diverse student backgrounds, positioning mathematics as both a tool for problem-solving and a medium for personal growth and ethical reflection.

METHOD

Research Design

This study follows a development research model aimed at producing educational materials for teaching basic mathematics with an integration of Islamic values. The research adopts the Plomp development model (1997), which encompasses five sequential stages: initial investigation, design, development, evaluation, and dissemination. These stages allow for a systematic approach to designing, validating, and assessing the practicality of the materials created. Although the full dissemination phase was not completed in this study, field trials were conducted to collect feedback for product refinement and to evaluate the usability of the developed materials within the target educational setting.

Development Stages in the Plomp Model

In the initial stage, a thorough needs analysis was conducted to assess the demand for culturally integrated mathematics teaching materials within the Mathematics Education Study Program at the State Islamic University of Mataram. This investigation included a review of relevant literature on value-based mathematics education, as well as consultations with educators and subject matter experts to understand the specific requirements for integrating

Islamic values into mathematics instruction. This stage helped identify the theoretical frameworks, educational goals, and content areas that would serve as the foundation for the teaching materials.

During the design phase, educational objectives were developed to align with both the mathematical and ethical competencies outlined by the program's curriculum. This phase also involved structuring the content to reflect the scientific horizon model, which integrates Islamic values with mathematics education. Design specifications included incorporating Qur'anic verses, ethical principles, and cultural examples that would help students relate mathematical concepts to Islamic teachings. Visual aids, instructional prompts, and problem-solving tasks were tailored to reinforce the integration of Islamic values throughout the curriculum.

In the development stage, the actual production of the teaching materials took place, involving iterative reviews by subject matter experts to ensure accuracy and cultural sensitivity. The materials were structured to cover fundamental mathematics topics such as number theory, algebra, and geometry, with Islamic contextual elements embedded in the explanations and examples. For instance, concepts such as symmetry and balance were illustrated through religious architectural examples, and ethical concepts were embedded in problem-solving activities. The development phase included multiple rounds of revisions based on feedback from content specialists in both mathematics and Islamic studies.

The evaluation phase was conducted to assess the validity and practicality of the developed materials. This process involved two main components: (1) Expert Validation: Subject matter experts, including experienced educators and practitioners in Islamic education, evaluated the materials using a standardized product validation instrument. Criteria for validation focused on content accuracy, cultural relevance, clarity of language, and instructional effectiveness. Expert evaluations provided a validity score for each component, with an overall average score of 4.05, categorizing the materials as "valid." (2) Field Trials: To evaluate the practicality of the teaching materials, a field trial was conducted with a sample of 50 first-semester students enrolled in the Mathematics Education Study Program. Students used the materials as part of their coursework in a basic mathematics class, and feedback was gathered through questionnaires that assessed the clarity, engagement, and relevance of the content. Results showed that 90% of students responded positively, indicating that the materials were practical and effective in helping them understand mathematics through an Islamic perspective.

While full-scale dissemination was outside the scope of this study, preliminary dissemination efforts included sharing the validated teaching materials with faculty members within the Mathematics Education department. Recommendations for further testing and refinement were made for future research to extend the use of these materials to broader educational contexts.

Sampling and Data Collection

The sampling strategy targeted students enrolled in the Mathematics Education Study Program at the State Islamic University of Mataram. Participants in the field trials were 50 first-semester students taking a foundational mathematics course. This sample was selected based on its relevance to the intended audience of the teaching materials, ensuring that the feedback was representative of the students who would ultimately benefit from the curriculum. Data were collected through a combination of expert evaluations and student questionnaires. Expert assessments provided qualitative feedback on the materials' validity, while student questionnaires offered insights into the practical usability and relevance of the content.

To improve reproducibility, detailed demographic data of participants, including their educational background and familiarity with Islamic values, were collected and analyzed to determine any influence on their responses. Students' feedback, collected using structured questionnaires, provided both qualitative and quantitative data regarding their experience with

the materials, focusing on aspects such as ease of understanding, engagement level, and perceived relevance of Islamic integration in mathematical concepts.

Validation and Practicality Assessment

Validation Criteria

The validity of the materials was assessed using established criteria to ensure alignment with both mathematical accuracy and Islamic cultural relevance. This assessment involved expert reviewers who evaluated the materials based on clarity, appropriateness of content, and alignment with educational goals. The review process incorporated statistical analysis to determine inter-rater reliability, ensuring consistency among the expert ratings. The average validity score of 4.05 indicated that the teaching materials met the necessary standards for use in an academic setting.

Practicality Measures

The practicality of the teaching materials was evaluated through direct student feedback during field trials. Students completed questionnaires that rated the materials on a Likert scale, assessing the clarity of instructions, relevance of examples, and overall ease of use. Additionally, open-ended questions allowed students to provide qualitative feedback on how well the Islamic values embedded in the materials enhanced their understanding of mathematics. The practicality evaluation revealed a high satisfaction rate, with 90% of students expressing a positive response toward the materials' relevance and effectiveness in connecting mathematics to Islamic teachings.

Statistical Analysis

Quantitative data collected from the field trials were analyzed using descriptive statistics to assess the overall practicality and acceptability of the materials. The data were examined for trends in student responses, and reliability tests were conducted to confirm the consistency of the questionnaire results. Statistical significance was tested to confirm the high positive response rate, reinforcing the practicality findings and supporting the use of these materials as a reliable teaching tool.

Ethical Considerations

In developing and evaluating culturally integrated educational materials, particular attention was given to ethical considerations. Experts involved in the validation process were selected based on their expertise in mathematics education and Islamic studies to ensure balanced and culturally respectful content. The field trials were conducted with full consent from participants, who were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. These ethical protocols ensured that the research process respected both the cultural context and the rights of participants.

RESULTS AND DISCUSSION

Overview of Findings

The study produced mathematics teaching materials that integrated Islamic values, based on the scientific horizon model, to support the State Islamic University of Mataram's vision of combining academic learning with Islamic ethical education. The validation and practicality assessments yielded positive results, indicating that these materials are both effective and culturally appropriate for enhancing students' comprehension of mathematics through an Islamic perspective. The results confirm that embedding Islamic values within mathematics instruction can enhance cognitive understanding, ethical reflection, and student engagement, fulfilling the study's objective of providing relevant and practical educational resources.

Validation of the Teaching Materials

The teaching materials were subjected to a thorough validation process, assessed by experts in both mathematics and Islamic studies to ensure alignment with educational standards

and cultural relevance. Validation criteria included clarity, coherence, instructional design, cultural integration, and relevance to the Islamic context. Table 1 displays the average ratings provided by the expert validators across key components of the teaching materials.

Table 1. Teaching Material Validation Data

Component	Validator 1	Validator 2	Validator 3	Validator 4	Average
Introduction	4.00	4.00	4.00	4.50	4.13
Technical Instructions	3.60	4.00	3.60	4.00	3.80
Book Structure	4.20	4.40	3.80	4.60	4.25
Organization of Content	4.00	4.50	3.67	4.00	4.04
Overall Average					4.09

The expert assessments provided an overall average validation score of 4.09, classifying the materials within the "valid" category. This rating signifies that the developed materials meet academic and cultural standards, validating their use as educational resources in mathematics courses. Experts highlighted that integrating Islamic values into the lessons added depth to the learning process, connecting mathematical principles with moral concepts familiar to students. Specifically, experts noted that this integration enhanced students' understanding by situating abstract mathematical ideas, such as infinity or rational numbers, within relatable, culturally resonant contexts.

Practicality of the Teaching Materials

The practicality of the teaching materials was tested through field trials involving 50 first-semester students enrolled in a basic mathematics course within the Mathematics Education Study Program. Students evaluated various aspects of the materials, including the clarity of language, presentation structure, relevance of content, and visual appeal. Table 2 presents a summary of the student responses.

Table 2. Student response data to learning models

Rated Aspect	Positive Response	Negative Response
Subject Matter Relevance	40	10
Material Presentation Structure	45	5
Discussion of Content Clarity	47	3
Interest in Future Learning with Materials	45	5
Language Accessibility	45	5
Visual Engagement (Illustrations, etc.)	48	2

Results from the student evaluations showed that over 90% of participants responded positively to the teaching materials, particularly noting their clarity, accessibility, and relevance to Islamic contexts. This high level of positive feedback aligns with research findings on culturally responsive pedagogy, which emphasize that students engage more deeply with content that reflects their own cultural and religious backgrounds (Bolger & Ecklund, 2018).

Key Findings on Engagement and Understanding

The field trials revealed that integrating Islamic values in mathematics education has substantial benefits for student engagement and understanding. When students encountered mathematical concepts framed within Islamic contexts—such as using modulus to explore prayer cycles or illustrating infinity with Qur'anic references—90% of participants indicated that the materials felt relevant and practically applicable. This engagement supports findings from previous studies, such as Nuryami (2023), which highlight the impact of cultural relevance in fostering deeper connections to subject matter.

Moreover, students indicated that the religiously contextualized examples facilitated their comprehension of complex mathematical ideas, a sentiment confirmed in qualitative feedback. For instance, students expressed that framing the concept of infinity in terms of "limitless knowledge" as described in the Qur'an helped them better grasp the abstract nature of rational numbers.

The results demonstrate that the teaching materials developed using the scientific horizon model effectively fulfill both cognitive and cultural needs. With validation scores averaging 4.09 and high levels of student satisfaction in practicality, the materials show promise in making mathematics education more accessible, meaningful, and aligned with Islamic values. These outcomes confirm the study's objectives and underscore the value of culturally integrated teaching resources for enhancing educational engagement and comprehension among students.

Discussion

Integration of Islamic Values

The results of this study indicate that the integration of Islamic values into mathematics teaching materials can substantially improve both engagement and comprehension among students. By incorporating familiar religious concepts, such as infinity and modularity in prayer routines, the materials provided students with a framework that resonated with their cultural and spiritual backgrounds. This finding supports previous research that shows culturally responsive pedagogy enhances students' connection to the subject matter by making abstract concepts more relatable (Nuryami, 2023).

A primary example of this effectiveness is reflected in students' feedback on the "modulus" lesson, which contextualized the concept through Islamic prayer cycles. This lesson was particularly well-received, with 90% of students indicating that the cultural relevance of the material enhanced their understanding of modular arithmetic (Table 2). This result aligns with Bolger and Ecklund's (2018) findings, which suggest that culturally embedded lessons increase engagement, especially when mathematical concepts are connected to students' daily practices. By linking mathematics to religious observances, the materials allowed students to view mathematics as not only relevant but also integral to their daily lives and religious identity.

Validation Findings

The high validation scores (average of 4.09) from expert reviewers confirm that the developed materials meet standards of both educational rigor and cultural relevance. Experts particularly praised the structure and organization of the materials, with average ratings of 4.20 and 4.25, respectively (Table 1), indicating that the materials were effective in integrating Islamic values with academic content. This high level of expert approval underscores the importance of thoughtful, structured design in culturally integrated curricula.

These ratings highlight that embedding Islamic principles within mathematics does not compromise academic rigor; rather, it adds an enriching layer of meaning. For instance, experts observed that the use of Qur'anic references in discussing the concept of infinity added depth to students' understanding. By associating the mathematical concept of infinity with the Qur'anic description of "limitless knowledge," students were able to connect the mathematical content with a culturally significant narrative, reinforcing both comprehension and engagement. This finding aligns with studies on culturally relevant pedagogy, which demonstrate that education that reflects students' cultural values enhances academic engagement and critical thinking (Choirudin et al., 2021).

Practicality and Student Engagement

The practicality assessment revealed that students responded positively to the clarity of language, organization, and visual presentation of the teaching materials. Table 2 indicates that 45 out of 50 students found the materials easy to understand, while 48 students appreciated the

visual design, which included images and structured layouts that enhanced accessibility. Such high ratings in language accessibility and visual appeal suggest that culturally adapted materials, when carefully designed, can remove barriers to learning by making content more engaging and relatable.

The positive response to the language and presentation elements reflects the students' appreciation for materials that speak directly to their cultural and spiritual identities. This finding aligns with Acharya et al. (2022), who emphasize that culturally adapted educational materials improve student attitudes toward mathematics. By delivering content in a format that resonates both visually and linguistically, the materials developed in this study facilitated a learning experience that was not only cognitively but also emotionally engaging.

Implications for Ethical and Holistic Education

One of the key insights from this study is that integrating Islamic values within mathematics instruction serves not only an academic purpose but also a moral and ethical one. The materials encouraged students to view mathematics through an ethical lens, such as considering fairness and accountability in problem-solving. This approach to mathematics education aligns with Acharya et al. (2022), who found that culturally responsive education fosters ethical and critical thinking skills.

For example, the study's materials incorporated the ethical dimensions of Islamic teachings, such as the Qur'anic verses emphasizing limitless knowledge, which prompt students to consider the broader moral implications of mathematical concepts like infinity. This integration aligns mathematics with students' values, fostering an understanding of mathematics as a tool not only for problem-solving but also for ethical decision-making. By grounding abstract mathematical principles in ethical and spiritual narratives, the materials support a holistic educational experience that prepares students for both intellectual and moral growth.

The findings of this study support and extend previous research on culturally responsive education. Studies by Fauzi et al. (2022) and Naidoo (2021) demonstrate that culturally embedded STEM curricula improve students' comprehension and retention by connecting content to students' real-life experiences. The Islamic-based teaching materials developed in this study similarly helped students connect with complex mathematical concepts by situating them within familiar cultural and religious contexts.

This study also resonates with the findings of Isroi et al. (2022), who observed that contextual learning encourages collaborative experiences in mathematics classrooms. During field trials, students frequently engaged in group discussions around the ethical implications of mathematical problems. This social interaction fostered a sense of community and collaboration, highlighting the potential of value-based education to promote teamwork and peer learning.

While the study's findings are promising, its scope was limited to a single educational setting, which may affect the generalizability of the results. Future research should explore similar integrations across different educational institutions and cultural contexts to validate and expand upon these findings. Additionally, longitudinal studies could provide insight into the long-term impacts of culturally integrated mathematics education on both academic performance and ethical development.

Future studies might also examine how integrating Islamic values impacts specific skills, such as critical thinking and problem-solving, in mathematics. Extending this approach to other STEM subjects could reveal broader educational benefits, contributing to a more inclusive and culturally attuned framework for holistic STEM education.

The integration of Islamic values within mathematics teaching materials proved to be an effective approach for enhancing student engagement, comprehension, and ethical reflection. With high validation scores and positive feedback from students, the results confirm that culturally integrated teaching resources can meet academic standards while resonating with

students' cultural and spiritual identities. By providing a holistic framework that connects academic content with ethical values, the scientific horizon model offers a meaningful pathway for advancing culturally responsive mathematics education.

CONCLUSION

This study demonstrated the effectiveness of integrating Islamic values into mathematics education through the development of culturally responsive teaching materials based on the scientific horizon model. The results confirmed that embedding Islamic principles within mathematics instruction not only reinforces students' comprehension of mathematical concepts but also enhances their engagement and ethical reflection. With an average validation score of 4.09, the materials were rated as valid by experts, affirming their academic rigor and cultural relevance. Student feedback further revealed a 90% positive response to the materials' clarity, accessibility, and cultural resonance, underscoring the impact of aligning educational content with students' cultural identities. Integrating religious teachings—such as Qur'anic reflections on infinity and prayer cycle calculations in modular arithmetic—provided students with a familiar framework that made complex mathematical ideas more accessible and meaningful. This study supports the potential of value-based education in mathematics to foster both cognitive and moral growth, bridging the gap between secular and religious knowledge and fostering a holistic learning experience. Overall, these findings contribute to the growing body of literature on culturally responsive pedagogy, demonstrating that mathematics can be taught in ways that honor students' cultural identities while meeting academic standards.

RECOMMENDATION

To build on the promising outcomes of this study, further efforts should be directed toward refining and expanding the use of culturally integrated mathematics materials in Islamic educational institutions. Future research should involve larger, more diverse sample populations across multiple educational settings to validate and generalize the findings. Additionally, longitudinal studies are recommended to explore the long-term effects of culturally integrated curricula on students' academic performance, ethical development, and overall engagement with mathematics. Professional development programs should be implemented to train educators in effectively delivering culturally responsive mathematics instruction, equipping them with both pedagogical skills and cultural competencies. Expanding this approach to other STEM subjects could also reveal broader educational benefits, supporting a holistic framework that prepares students for ethical decision-making in scientific and technical fields. Lastly, educational policymakers should consider adopting culturally integrated models, such as the scientific horizon approach, to create curricula that reflect students' cultural and religious values, fostering an inclusive and ethically grounded educational environment.

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