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Bridging Islamic Values and Mathematical Habits of Mind: A Systematic Review of Character Development in Mathematics Education

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Abstract

The integration of Islamic values into mathematics education has been explored as an approach to character development, yet the conceptual relationship between Islamic values and Mathematical Habits of Mind (MHoM) remains insufficiently specified. In particular, it is unclear how specific Islamic values correspond to mathematical dispositions and how these dispositions may provide opportunities for enacting values in ways relevant to character development. This study systematically reviewed the literature to map these relationships and develop an integrated conceptual framework. Following PRISMA guidelines, a systematic literature review was conducted using Google Scholar, ERIC, and Springer, resulting in 35 studies published between 2015 and February 2026. The studies were manually coded and thematically synthesized to identify recurring Islamic values, MHoM dimensions, and their conceptual relationships with character development. Six Islamic values emerged: ṣidq, amānah, istiqāmah, mujāhadah, tafakkur, and muḥāsabah. Among MHoM dimensions, persistence/perseverance was most frequently identified (10 studies; 28.6%), followed by reflective thinking/metacognition and reasoning/justification (eight studies each; 22.9%). However, only three studies (8.6%) explicitly examined the combined relationship among Islamic values, MHoM, and character development. The synthesis suggests that existing research more often addresses value integration or MHoM separately than investigates their intersection. The proposed framework explains Islamic values as the ethical–spiritual orientation of mathematical activity, MHoM as the dispositions through which these values may be enacted, and character development as a potential outcome of sustained enactment and reflection. By distinguishing these complementary roles, the framework provides a basis for designing and empirically testing mathematics education that connects mathematical thinking with ethical–spiritual character development.

Keywords: Character Development; Islamic Values; Mathematical Habits of Mind; Mathematics Education; Systematic Literature Review.

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INTRODUCTION

Character development is an important objective of contemporary education. In mathematics education, mathematical reasoning, problem solving, and reflection provide opportunities to develop productive thinking dispositions and character

(Gordon, 2011; Pei et al., 2018). Previous studies have associated Mathematical Habits of Mind (MHoM) with students' critical thinking, reasoning, and mathematical connections (Ariawan et al., 2022; Indriani & Retnawati, 2025). These practices may also foster perseverance, intellectual honesty, and responsibility in mathematical work, highlighting the potential of mathematics education to support both mathematical competence and character development. Studies on character-integrated mathematics education suggest that embedding character values into learning activities can connect mathematical learning with character development, particularly through the cultivation of character-oriented learning practices (Rahmah et al., 2022; Siregar et al., 2024). Thus, mathematics education has the potential to function not only as a means of developing mathematical competence but also as a context for cultivating students' character.

In Islamic mathematics education, previous studies have examined the integration of Islamic values through learning models, teaching materials, and classroom practices (Ayyubi et al., 2026; Nurhikmah, Imam, et al., 2024; Rizal et al., 2023). Other research has addressed Islamic values in character education and their internalization in students' moral development (Ikhwan, 2025; Tambak et al., 2021). However, these strands of research do not yet clearly explain how Islamic values can be systematically connected with MHoM to support character development through mathematical activity. This gap highlights the need for a framework that links Islamic values as an ethical foundation with MHoM as mathematical thinking practices.

The integration of Islamic values into mathematics education has been implemented through several pedagogical and curricular approaches. At the instructional-material level, studies have developed mathematics modules to enhance learning motivation (Hifzhi et al., 2024) and e-modules incorporating Islamic values (Salam et al., 2025). At the curricular level, Islamic values have been incorporated to connect mathematical content with students' religious contexts (Ulpah et al., 2025). Meanwhile, classroom-based approaches have explored the integration of Islamic values through interactive worksheets and mathematics learning practices (Johar et al., 2025; Muslimin et al., 2025; Setiawan, Idris, et al., 2025). Despite these developments, the integration often focuses on embedding Islamic values into learning materials or content, leaving less clarity about how these values are enacted through mathematical thinking processes and internalized as students' character. Thus, the key issue is not merely whether Islamic values are present in mathematics education, but how they can be connected with students' MHoM to support character development.

However, the successful internalization of values requires more than the explicit inclusion of religious principles in instructional materials or curriculum documents. Students need opportunities to enact and develop those values through mathematical activities that encourage particular ways of thinking and behaving. In this regard, MHoM provides a relevant conceptual perspective. MHoM refers to productive mathematical dispositions and ways of thinking that involve reasoning, exploring, conjecturing, making connections, reflecting, generalizing, and communicating mathematical ideas (Gordon, 2011; Pei et al., 2018). The development of such habits has been associated with students' mathematical reasoning, critical thinking, creative thinking, and mathematical connections (Ariawan et al., 2022; Hafni

et al., 2019; Purnomo et al., 2024). Importantly, these habits also involve persistence, reflective thinking, intellectual responsibility, and disciplined engagement with mathematical problems, making MHoM potentially relevant to character development rather than being limited to cognitive achievement (Indriani & Retnawati, 2025; Siregar et al., 2024).

Islamic values can be conceptually connected with the dispositions promoted through Mathematical Habits of Mind (MHoM). For example, *ṣidq* (honesty) relates to presenting mathematical reasoning accurately, *amānah* (responsibility) to taking responsibility for mathematical work, *istiqāmah* (consistency) to persistence in problem solving, and *tafakkur* (reflection) and *muḥāsabah* (self-evaluation) to reflective mathematical thinking. However, no review has mapped how Islamic values and MHoM jointly contribute to character development. Existing studies have examined Islamic values through instructional integration and curriculum, including teachers' understanding of integration in elementary mathematics (Hadi & Rachmadtullah, 2025) and patterns of Qur'anic value integration in mathematics learning (Lestari et al., 2025). Research on MHoM, meanwhile, has investigated its relationships with mathematical resilience and sociomathematical norms (Maarif & Fitriani, 2023) and the development of MHoM and reasoning through training (Tashtoush et al., 2022). Wilujeng & Aristiawan (2024) have taken a step toward bridging these perspectives by developing e-books integrating MHoM and Islamic characters. Nevertheless, how specific Islamic values correspond to particular MHoM dispositions and how their relationship may support character development remain insufficiently synthesized.

This fragmentation indicates an important research gap. Research on Islamic values in mathematics education has generated evidence concerning value integration, instructional materials, curriculum, and character development, while research on Mathematical Habits of Mind (MHoM) has examined mathematical thinking and learning dispositions. The most relevant synthesis by Hasibuan et al. (2024) reviews Islamic integration in elementary mathematics education, but its focus does not explicitly map the relationship between Islamic values and MHoM or explain how their intersection may support character development. Thus, the current state of the literature provides a foundation for understanding each perspective separately but does not yet offer an integrated account of their potential relationship. A systematic synthesis is therefore needed to identify the Islamic values represented in mathematics education, examine how MHoM is conceptualized and implemented, and clarify how the two perspectives may interact in supporting students' character development.

Therefore, this study conducts a systematic literature review (SLR) to synthesize Islamic values and MHoM as complementary constructs for character development in mathematics education. This review offers a novel perspective by synthesizing how these two perspectives may be connected to support character development in mathematics education. In this study, Islamic values refer to ethical and spiritual principles derived from Islamic teachings, whereas Islamic character refers to the dispositions and behaviors reflecting the internalization of these values. MHoM is considered a set of mathematical thinking dispositions through which these values may be expressed in mathematical activity. Specifically, this review addresses the following research questions:

RQ1: What Islamic values have been integrated into mathematics education to support students' character development?
RQ2: How are the dimensions of Mathematical Habits of Mind represented in mathematics education for character development?
RQ3: What is the conceptual relationship between Islamic values and Mathematical Habits of Mind in fostering character development in mathematics education?

By addressing these questions, this review aims to develop an integrated conceptual understanding of Islamic values and MHoM in mathematics education. The resulting framework is intended to provide a theoretical basis for future research and inform curriculum development, instructional design, and teaching practices that seek to promote mathematical competence alongside students' character development.

METHOD

Research Design

This study employed a systematic literature review (SLR), rather than a meta-analysis, to synthesize existing evidence on the integration of Islamic values and Mathematical Habits of Mind (MHoM) for character development in mathematics education. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines because they provide a structured framework for transparently reporting the identification, screening, eligibility assessment, and inclusion of studies. The review consisted of four stages: identification, screening, eligibility assessment, and inclusion of relevant studies.

Search Strategy

The literature search was conducted in February 2026 using three sources: Google Scholar, ERIC (Education Resources Information Center), and SpringerLink. Google Scholar was selected for its broad coverage of scholarly publications, ERIC for its focus on educational research, and SpringerLink to identify relevant academic publications. Scopus and Web of Science were not included because of access limitations. Although Google Scholar offers broad coverage, it is not a curated bibliographic database, and its search results may vary. Therefore, the use of these sources may have excluded relevant studies indexed in other databases, which should be considered when interpreting the findings.

The search was limited to studies published from 2015 through February 2026 and written in English or Indonesian. The search strategy combined keywords related to Islamic values, Mathematical Habits of Mind (MHoM), character development, and mathematics education using Boolean operators. The search strings were adapted to the search functions of each source.

Google Scholar

("Islamic values" OR "Islamic character" OR "Islamic education") ("Mathematical Habits of Mind" OR "Habits of Mind") ("character development" OR "character education") ("mathematics education" OR "mathematics learning")

ERIC

("Islamic values" OR "Islamic character" OR "Islamic education") AND ("Mathematical Habits of Mind" OR "Habits of Mind") AND ("character development" OR "character education") AND ("mathematics education" OR "mathematics learning")

SpringerLink

("Islamic values" OR "Islamic character" OR "Islamic education") AND ("Mathematical Habits of Mind" OR "Habits of Mind") AND ("character development" OR "character education") AND ("mathematics education" OR "mathematics learning")

The retrieved studies were subsequently screened according to the predefined eligibility criteria, including publication period, language, and relevance to the research questions.

Eligibility Criteria and Study Selection

Studies were selected according to predefined inclusion and exclusion criteria. Eligible studies were (1) peer-reviewed journal articles, (2) published between 2015 and February 2026, (3) written in English or Indonesian, (4) focused on mathematics education, and (5) discussed Islamic values, Mathematical Habits of Mind (MHoM), character development, or the relationships among these constructs. Conference proceedings, books, book chapters, theses, dissertations, editorials, duplicate publications, and studies unrelated to mathematics education were excluded. All retrieved records were exported to a reference management application to facilitate duplicate removal and screening. The remaining studies were screened based on their titles and abstracts. Full-text articles that met the eligibility criteria were then assessed before the final studies were included in the review. The study selection process is illustrated in the PRISMA 2020 flow diagram (Figure 1).

The initial search identified 745 records from Google Scholar (n = 684), ERIC (n = 27), and SpringerLink (n = 34). After removing 86 duplicate records, 659 records remained for title and abstract screening, of which 552 were excluded as irrelevant. Subsequently, 107 full-text reports were sought for retrieval, but six could not be retrieved. The remaining 101 reports were assessed for eligibility. Of these, 66 were excluded for the following reasons: they were outside the scope of mathematics education (n = 30), were not related to Islamic values, Mathematical Habits of Mind (MHoM), or character development (n = 22), were not peer-reviewed journal articles (n = 9), or contained insufficient methodological information (n = 5). Ultimately, 35 studies met the eligibility criteria and were included in the final review.

Data Extraction

Data from the included studies were extracted manually by the researcher using a standardized extraction form developed based on the research questions and objectives of the review. The form covered publication details (author and year), country, educational level, research design, forms of Islamic value integration, dimensions of Mathematical Habits of Mind (MHoM), character outcomes, and the main findings of each study. The form was used consistently across all included studies to maintain uniformity in data collection. Extracted information was organized into summary tables to facilitate comparison, identification of recurring patterns, and synthesis of findings across studies.

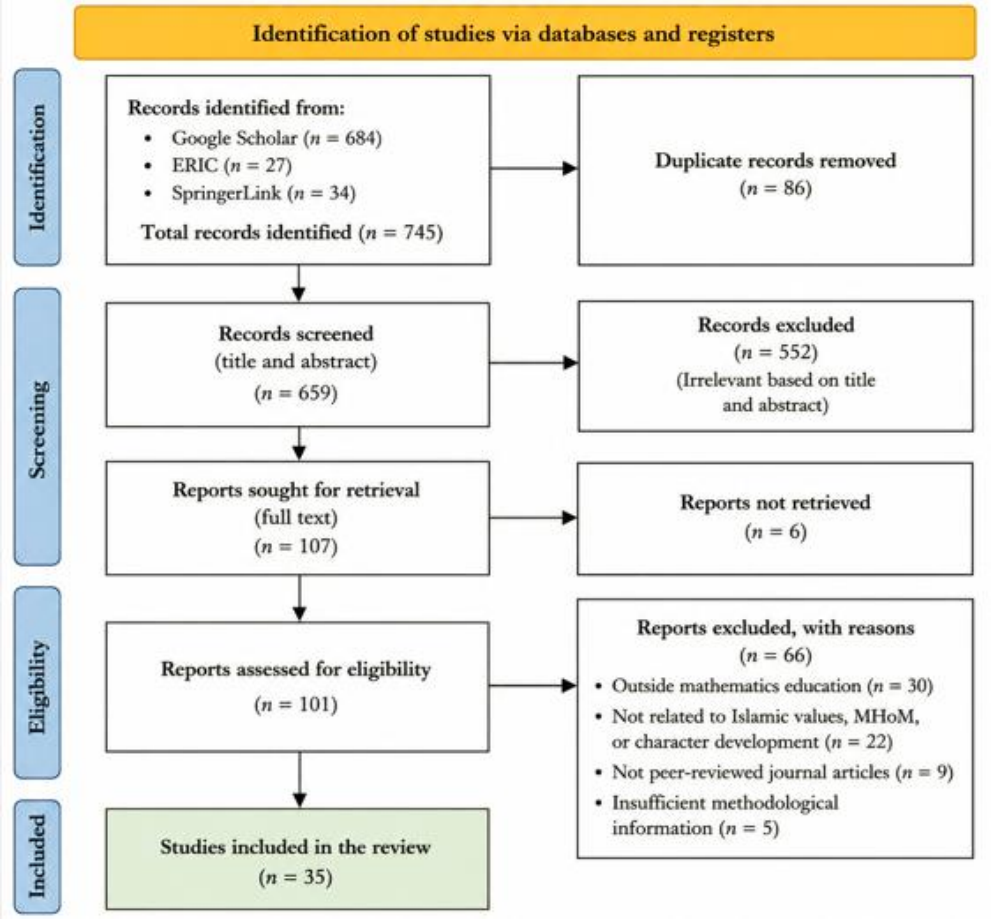


Figure 1. PRISMA flow diagram of the study selection process.

Data Analysis and Thematic Synthesis

The extracted data were analyzed using thematic synthesis. The researcher conducted the coding manually by examining the findings of each included study and identifying concepts related to Islamic values, Mathematical Habits of Mind (MHoM), and character development. Similar codes were grouped into descriptive themes, which were subsequently interpreted to develop analytical themes. These themes were used to examine recurring patterns, similarities, and differences across studies and to synthesize the conceptual relationships among the three constructs. As the coding was conducted by a single researcher, inter-rater reliability was not calculated. The coding and interpretation were based on the information reported in the original articles.

Critical Appraisal

A formal critical appraisal of the methodological quality and risk of bias of the included studies was not conducted. Therefore, the findings should be interpreted as a synthesis of the available literature rather than as evidence that all identified

approaches are equally rigorous or effective. This limitation was considered when interpreting the results and formulating the conceptual framework.

Ethical Considerations

Ethical approval was not required because this study synthesized previously published literature and did not involve direct data collection from human participants. The review relied on published sources, which were appropriately acknowledged through citations and references.

RESULTS

Overview of the Included Studies

The included studies were characterized based on publication year, country, educational level, research design, and main research focus. The distribution of these characteristics is presented in Table 1.

Table 1. Characteristics of the Included Studies

Characteristic	Category	n	%
Publication Year	2015–2020	4	11.4
	2021–2023	9	25.7
	2024–2026	22	62.9
Country	Indonesia	30	85.7
	Thailand	1	2.9
	Oman	1	2.9
	United States	1	2.9
	Pakistan	1	2.9
	Israel	1	2.9
Educational Level	Elementary School	6	17.1
	Junior High School	2	5.7
	Senior High School	3	8.6
	Higher Education (including Pre-service/Teacher Education)	8	22.9
	General/Multiple/Not Reported	16	45.7
Research Design	Qualitative	10	28.6
	Quantitative	7	20.0
	Research & Development	7	20.0
	Literature/Conceptual	7	20.0
	Other empirical/design-based	4	11.4
Main Research Focus	Islamic Values Integration	13	37.1
	Character Development	5	14.3
	Mathematical Habits of Mind	8	22.9
	Islamic Values & Character	6	17.1
	Islamic Values, MHoM & Character	3	8.6

Islamic Values Integrated into Mathematics Education (RQ1)

To answer RQ1, a thematic analysis was conducted to identify the Islamic values integrated into mathematics education across the included studies. Table 2 presents the frequency and distribution of the dominant Islamic values identified across the reviewed studies.

Table 2. Dominant Islamic Values Integrated into Mathematics Education

Islamic Value	N	%

Ṣidq (Truthfulness/Honesty)	5	14.3
Amānah (Trustworthiness/Responsibility)	5	14.3
Istiqāmah (Consistency/Perseverance)	4	11.4
Mujāhadah (Striving/Perseverance)	4	11.4
Tafakkur (Deep Reflection/Contemplation)	5	14.3
Muḥāsabah (Self-Reflection/Self-Evaluation)	4	11.4

The identified values were represented through different forms of integration, including instructional materials, modules, e-books, worksheets, curriculum development, and classroom practices (Hifzhi et al., 2024; Johar et al., 2025; Salam et al., 2025; Ulpah et al., 2025; Wilujeng & Aristiawan, 2024). The reviewed studies also associated Islamic-value integration with character-related outcomes, including honesty, responsibility, discipline, motivation, and reflective learning behavior (Hadi, Hartono, et al., 2025; Ilma et al., 2020; Rizal et al., 2023; Setiawan, Idris, et al., 2025). However, the extent to which these values were enacted through mathematical activity varied across the studies.

Characteristics of Mathematical Habits of Mind (RQ2)

To answer RQ2, a thematic analysis was conducted to identify the key characteristics of Mathematical Habits of Mind (MHoM) reported across the included studies. The analysis shows that MHoM represents a multidimensional set of productive mathematical dispositions that influence how students approach, explore, evaluate, and communicate mathematical ideas. Rather than focusing only on the correctness of answers, MHoM emphasizes the process and disposition underlying mathematical thinking, particularly when students encounter complex, unfamiliar, or non-routine problems. The identified characteristics and their descriptions are presented in Table 3.

Table 3. Characteristics of Mathematical Habits of Mind

MHoM Characteristic	Description	n	%
Persistence / Perseverance	The disposition to sustain effort when facing challenging or non-routine mathematical problems and to continue working by revising strategies when initial attempts are unsuccessful.	10	28.6
Reflective Thinking / Metacognition	The ability to monitor, evaluate, and regulate mathematical thinking by examining strategies, identifying errors, and assessing the effectiveness of solutions.	8	22.9
Reasoning and Justification	The disposition to develop logical arguments, use mathematical evidence, explain solution processes, and justify the validity of mathematical conclusions.	8	22.9
Problem-Solving Flexibility	The ability to consider alternative strategies, modify approaches when necessary, and adapt mathematical thinking to different problems or representations.	6	17.1
Mathematical Communication	The disposition to express mathematical ideas, reasoning, procedures, and conclusions clearly using appropriate mathematical language and representations.	5	14.3
Making Connections /	The ability to identify and establish relationships among mathematical concepts, representations, procedures, and real-world contexts.	5	14.3

MHoM Characteristic	Description	n	%
Seeing Relationships / Creativity / Generating Multiple Strategies	The disposition to generate, explore, and compare different mathematical ideas, representations, or strategies for solving problems.	4	11.4

The findings indicate that persistence/perseverance is the most frequently identified MHoM characteristic, followed by reflective thinking/metacognition and reasoning and justification. Other characteristics include problem-solving flexibility, mathematical communication, making connections, and creativity. Overall, the findings show that the reviewed literature emphasizes sustained effort, reflective thinking, and mathematical reasoning, while other dimensions of MHoM receive comparatively less attention.

Conceptual Relationship between Islamic Values and Mathematical Habits of Mind for Character Development (RQ3)

To answer RQ3, a conceptual synthesis was conducted to map the relationships among Islamic values, Mathematical Habits of Mind (MHoM), and character development in mathematics education. The synthesis identified six Islamic values and their corresponding MHoM characteristics and potential character development outcomes, as presented in Table 4. *Ṣidq* was associated with verifying solutions and presenting mathematical reasoning accurately; *Amānah* with monitoring learning processes and taking responsibility for mathematical work; *Istiqāmah* and *Mujāhadah* with persistence and sustained effort; and *Tafakkur* and *Muḥāsabah* with examining mathematical relationships, reflecting on reasoning, and evaluating solution strategies. These conceptual correspondences are consistent with studies integrating Islamic values, mathematical habits of mind, and character in mathematics education (Hifzhi et al., 2024; Johar et al., 2025; Nurhikmah, Ayyubi, et al., 2024; Putra et al., 2026; Siregar et al., 2024; Wilujeng & Aristiawan, 2024).

Table 4. Conceptual Mapping between Islamic Values, MHoM and Character Development

Islamic Values	MHoM	Character Development Outcome
Honesty (Ṣidq)	Verifying solutions, presenting mathematical procedures accurately, and reasoning based on evidence	Intellectual integrity, honesty, and truthfulness
Responsibility (Amānah)	Monitoring learning processes, evaluating solutions, and taking responsibility for mathematical work	Responsibility, accountability, and self-regulation
Consistency and Perseverance (Istiqāmah)	Persistence in solving problems and sustaining mathematical engagement	Discipline, perseverance, and resilience
Striving (Mujāhadah)	Sustained effort, exploring alternative strategies, and continuing to work through difficult problems	Determination, resilience, and productive persistence

Islamic Values	MHoM	Character Development Outcome
Contemplation (Tafakkur)	Exploring mathematical relationships, making connections, reasoning, and examining mathematical ideas	Reflective thinking, intellectual curiosity, and critical awareness
Self-Reflection (Muḥāsabah)	Monitoring thinking processes, identifying errors, and evaluating solution strategies	Metacognitive awareness, self-evaluation, and responsibility

Overall, the mapping indicates that Islamic values and MHoM can be viewed as complementary constructs: Islamic values provide ethical and spiritual orientations, while MHoM represents dispositions expressed through mathematical activities. Their potential relationship with character development is reflected in outcomes such as intellectual integrity, responsibility, perseverance, critical awareness, and self-regulation. However, this mapping represents a conceptual synthesis of the reviewed literature rather than evidence of a direct causal relationship among the three constructs.

DISCUSSION

Overview of the Included Studies

The distribution of the included studies reveals an expanding but uneven research landscape concerning Islamic values, Mathematical Habits of Mind (MHoM), and character development in mathematics education. Publication activity increased substantially in 2024–2026, with 22 studies (62.9%), compared with nine studies (25.7%) in 2021–2023 and four (11.4%) in 2015–2020. This recent concentration suggests growing scholarly attention to the topic. However, publication frequency alone does not demonstrate theoretical advancement or stronger empirical evidence; it indicates increased research activity that requires further examination in terms of research quality and contribution.

Geographically, the evidence is heavily concentrated in Indonesia, which accounts for 30 studies (85.7%). Thailand, Oman, the United States, Pakistan, and Israel are each represented by one study (2.9%). This concentration makes the Indonesian context central to the current evidence base but limits the extent to which the findings can be interpreted as internationally representative. The prominence of Islamic values in Indonesian mathematics education may partly explain this distribution, although the available data do not establish the reasons for it. Comparative research across educational and cultural contexts is therefore needed to examine whether the relationships among Islamic values, MHoM, and character development are context-specific or transferable.

The educational-level distribution reveals a further limitation in the evidence base. Although higher education, elementary school, junior high school, and senior high school are represented, 16 studies (45.7%) were categorized as general, multiple-level, or not reported. This category combines different situations, so its size should

not be interpreted as evidence that nearly half of the studies explicitly investigated multiple educational levels. Instead, it highlights limited precision in the reporting or classification of educational contexts, making it difficult to determine how the integration of Islamic values and MHoM may vary across age groups and stages of mathematical development.

Methodologically, qualitative research was the largest single category, comprising 10 studies (28.6%). Quantitative studies, research and development, and literature or conceptual studies each accounted for seven studies (20.0%), while other empirical or design-based approaches accounted for four (11.4%). This distribution indicates methodological diversity, with qualitative approaches providing opportunities to examine implementation and meaning, while quantitative and development-oriented studies offer different ways to investigate learning outcomes and instructional designs. Nevertheless, the distribution alone does not establish the rigor or effectiveness of these approaches. Given the review's focus on relationships among values, mathematical dispositions, and character, a key issue is whether studies move beyond describing integration toward systematically examining how these constructs relate to observable outcomes.

The distribution of research focus makes this issue particularly clear. Islamic values integration was the most frequently examined focus, appearing in 13 studies (37.1%), followed by MHoM in eight (22.9%), Islamic values and character in six (17.1%), and character development in five (14.3%). Only three studies (8.6%) explicitly focused on the combined relationship among Islamic values, MHoM, and character. This pattern identifies a substantive gap: research on the individual components is more prevalent than research examining their intersection. Consequently, although the literature provides a basis for connecting Islamic values with mathematical thinking and character education, direct evidence concerning the relationships among all three constructs remains limited. This gap reinforces the need for integrative frameworks and empirical studies that examine how mathematical dispositions may provide opportunities for enacting Islamic values and how such practices relate to character development.

Islamic Values and Character Development in Mathematics Education

The synthesis of studies identified six Islamic values relevant to character development in mathematics education: *Ṣidq* (truthfulness), *Amānah* (trustworthiness and responsibility), *Istiqāmah* (consistency and perseverance), Mujāhadah (striving and perseverance), *Tafakkur* (reflection and contemplation), and *Muḥāsabah* (self-reflection and self-evaluation). Previous studies have incorporated these values into mathematics learning materials, classroom practices, and curricular approaches, demonstrating the potential to connect mathematical activity with moral and religious principles (Ilma et al., 2020; Mahmudah & Muqowim, 2022; Nurhikmah, Imam, et al., 2024; Setiawan, Idris, et al., 2025). However, the presence of Islamic values in instructional content does not necessarily indicate their internalization as students' character. Ṣidq, for example, may be enacted through honest mathematical reporting and evidence-based justification, while Amānah may be reflected in students'

responsibility for monitoring and evaluating their solutions. These interpretations are consistent with studies addressing Islamic values and character formation in mathematics education (Hadi, Hartono, et al., 2025; Rizal et al., 2023; Setiawan, Idris, et al., 2025), but the extent to which such practices produce sustained character development remains insufficiently established.

Istiqāmah and Mujāhadah can be conceptually associated with persistence in mathematical problem solving, including sustained effort and the reconsideration of unsuccessful strategies. This connection resonates with research on mathematical thinking and persistence (Ariawan et al., 2022; Hafni et al., 2019; Purnomo et al., 2024) and studies examining motivation and engagement in Islamic-value-integrated learning (Hifzhi et al., 2024; Rahmah et al., 2022; Salam et al., 2025). Nevertheless, persistence as a MHoM is not automatically equivalent to the internalization of Istiqāmah or Mujāhadah. MHoM describes mathematical dispositions, whereas Islamic values provide an ethical and spiritual orientation for those dispositions (Indriani & Retnawati, 2025; Maarif & Fitriani, 2023; Tashtoush et al., 2022). Similarly, Tafakkur and Muḥāsabah can be connected with examining mathematical relationships, identifying errors, and evaluating reasoning, as suggested by studies integrating Islamic values, mathematical understanding, and character development (Hidayati et al., 2026; Nurhikmah, Imam, et al., 2024; Putra et al., 2026). Yet mathematical reflection and Islamic self-evaluation remain conceptually distinct unless learning activities explicitly connect mathematical reasoning with reflection on students' conduct and responsibilities.

A critical issue is that many integration approaches emphasize instructional materials, including modules, e-books, worksheets, and curriculum content (Hasibuan et al., 2024; Hifzhi et al., 2024; Salam et al., 2025; Ulpah et al., 2025; Wilujeng & Aristiawan, 2024). Although these approaches demonstrate practical ways to incorporate Islamic values, the inclusion of Qur'anic references or religious contexts alone cannot establish that students practice or internalize those values (Badri & Malik, 2024). More substantive integration requires alignment among learning objectives, mathematical tasks, classroom interactions, assessment, and reflection (Ilma et al., 2020; Nurhikmah, Imam, et al., 2024; Ulpah et al., 2025). Studies addressing Islamic integration and character development provide a basis for this perspective (Arizona et al., 2025; Johar et al., 2025; Setiawan, Walidin, et al., 2025; Siregar et al., 2024) while research on curriculum, teacher understanding, and instructional resources highlights the importance of pedagogical design (Hadi et al., 2025; Riwanda et al., 2025; Setiawan, Idris, et al., 2025; Ulpah et al., 2025; Hifzhi et al., 2024; Johar et al., 2025; Wilujeng & Aristiawan, 2024). Taken together, these studies support a conceptual framework in which Islamic values provide an ethical and spiritual foundation, MHoM represents mathematical dispositions through which values may be enacted, and character development constitutes a potential outcome. This framework offers a basis for designing value-oriented mathematical activities, but its effectiveness and long-term influence on students' character require further empirical investigation (Ayyubi et al., 2026; Nurhikmah, Imam, et al., 2024; Putra et al., 2026).

Characteristics of Mathematical Habits of Mind

The findings indicate that persistence/perseverance is the most frequently identified characteristic of Mathematical Habits of Mind (MHoM), followed by reflective thinking/metacognition and reasoning/justification. This pattern suggests that the reviewed literature primarily emphasizes students' capacity to sustain, monitor, and justify mathematical thinking. Persistence, however, should not be equated with merely spending more time on a problem. It involves maintaining engagement while evaluating strategies, learning from unsuccessful attempts, and determining alternative ways forward (Ariawan et al., 2022; Hafni et al., 2019; Tashtoush et al., 2022). Problem-based learning may provide opportunities to cultivate these dispositions through challenging mathematical situations (Purnomo et al., 2024).

This emphasis reflects the dispositional nature of MHoM. Rather than representing mathematical knowledge or procedural competence alone, MHoM concerns how students approach and respond to mathematical situations (Andriani et al., 2017; Dwirahayu et al., 2017; Gordon, 2011). Reflective thinking and metacognition are important because they enable students to monitor their reasoning, reconsider assumptions, and evaluate the validity of their solutions. Reasoning and justification further require students to explain why a procedure works rather than rely solely on correct answers. These characteristics are associated with critical thinking and mathematical reasoning in the reviewed literature (Ariawan et al., 2022; Hafni et al., 2019; Tashtoush et al., 2022). Nevertheless, their frequent identification does not establish that they are more important than other MHoM dimensions; it indicates which dispositions receive greater attention in the included studies.

Problem-solving flexibility, mathematical communication, making connections, and creativity extend this picture by emphasizing adaptability, the articulation of reasoning, relationships among mathematical ideas, and the generation of alternative strategies. Their presence is consistent with research connecting MHoM to computational thinking (Pei et al., 2018), mathematical connections (Ariawan et al., 2022; Indriani & Retnawati, 2025; Purnomo et al., 2024), communication (Johar et al., 2025), and creativity (Andriani et al., 2017). The comparatively lower frequency of these dimensions should not be interpreted as evidence of lesser educational value. It may instead reflect differences in how MHoM is conceptualized and examined across studies. This variation highlights the need for a more consistent account of MHoM dimensions and their operationalization in mathematics education.

The findings also reveal a conceptual intersection between MHoM and Islamic values. Persistence can be associated with *Istiqāmah* and *Mujāhadah*, while reflection has conceptual affinities with *Tafakkur* and *Muḥāsabah*. Existing studies provide points of connection between mathematical habits of mind and Islamic character or values (Johar et al., 2025; Siregar et al., 2024; Wilujeng & Aristiawan, 2024). However, these constructs should not be conflated: MHoM describes dispositions for engaging in mathematical thinking, whereas Islamic values provide an ethical and spiritual orientation for such engagement. Their integration therefore offers a conceptual basis

for considering not only how students reason mathematically but also how they enact responsibility, perseverance, and reflection. Nevertheless, these relationships should be understood as conceptual correspondences rather than evidence of a causal effect of Islamic values on MHoM or character development.

Relationship between Islamic Values, Mathematical Habits of Mind, and Character Development

The conceptual synthesis indicates that Islamic values and Mathematical Habits of Mind (MHoM) are complementary but conceptually distinct constructs. Islamic values provide moral and spiritual orientations, whereas MHoM represents the mathematical dispositions through which these orientations may be expressed in learning activities. Their relationship is reflected in six conceptual correspondences: *Ṣidq* with reasoning, justification, and verification; *Amānah* with metacognition and self-regulation; *Istiqāmah* and *Mujāhadah* with persistence and sustained effort; and *Tafakkur* and *Muḥāsabah* with mathematical reflection, making connections, and self-evaluation. These relationships are consistent with studies examining Islamic values, mathematical thinking, and character-oriented mathematics education (Hifzhi et al., 2024; Johar et al., 2025; Nurhikmah, Ayyubi, et al., 2024; Putra et al., 2026; Siregar et al., 2024; Wilujeng & Aristiawan, 2024). The relationships among these constructs and their potential contribution to character development are synthesized in Figure 2.

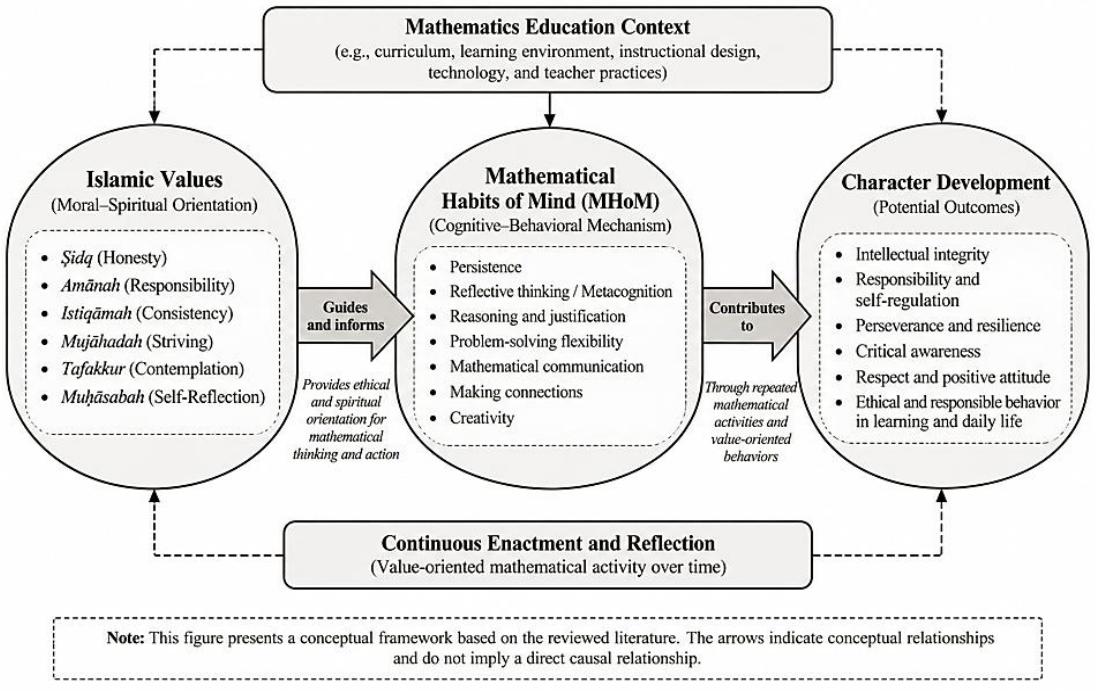


Figure 2. Conceptual framework linking Islamic values, Mathematical Habits of Mind, and character development in mathematics education.

The first important implication concerns how Islamic values can be translated into observable mathematical behavior. *Ṣidq* involves more than avoiding academic dishonesty; it can be expressed when students report calculations accurately, justify conclusions using evidence, and acknowledge errors (Ilma et al., 2020; Rizal et al., 2023; Setiawan, Idris, et al., 2025). Similarly, *Amānah* may be enacted through students'

willingness to monitor their work, evaluate the reasonableness of solutions, and take responsibility for their learning (Hadi, Andriani, et al., 2025; Rahmah et al., 2022; Setiawan, Walidin, et al., 2025). These examples suggest that MHoM provides opportunities for students to enact ethical values through mathematical activity rather than merely learn about those values as instructional content.

A second relationship concerns persistence and reflective thinking. *Istiqāmah* emphasizes consistency, whereas *Mujāhadah* emphasizes sustained striving in the face of difficulty. Both correspond with persistence in mathematical problem solving, a characteristic emphasized in MHoM research (Hafni et al., 2019; Purnomo et al., 2024; Tashtoush et al., 2022). Studies of Islamic-integrated mathematics education also highlight the potential to connect mathematical engagement with Islamic values (Hifzhi et al., 2024; Salam et al., 2025). Meanwhile, *Tafakkur* and *Muḥāsabah* can be associated with examining mathematical relationships, reconsidering strategies, identifying errors, and evaluating one's reasoning (Hidayati et al., 2026; Nurhikmah, Ayyubi, et al., 2024; Putra et al., 2026). These correspondences broaden the interpretation of mathematical persistence and reflection: they may serve not only cognitive purposes but also provide contexts for expressing value-oriented dispositions.

However, a mathematical disposition does not automatically represent the internalization of an Islamic value. Persistence, for example, may reflect task completion without necessarily embodying *Istiqāmah* or *Mujāhadah*. Likewise, checking a solution does not necessarily indicate *Muḥāsabah* unless it involves meaningful self-evaluation. This distinction is consistent with studies that explicitly connect MHoM with Islamic character (Johar et al., 2025; Siregar et al., 2024; Wilujeng & Aristiawan, 2024). The relationship therefore depends not only on the mathematical behavior itself but also on how students understand, enact, and reflect on that behavior in relation to the relevant value.

This distinction also challenges the assumption that including Islamic content in mathematics materials is sufficient for character development. Existing studies have explored integration through instructional materials and classroom practices (Hifzhi et al., 2024; Johar et al., 2025; Ulpah et al., 2025; Wilujeng & Aristiawan, 2024). Nevertheless, the presence of Islamic values in modules, worksheets, or learning activities does not by itself demonstrate that students have internalized them. Meaningful integration requires learning experiences in which students enact honesty through accurate mathematical reporting, demonstrate persistence while addressing challenging problems, and practice self-reflection when evaluating errors and strategies. Thus, the critical issue is not simply whether Islamic values are included, but whether pedagogical design connects those values with students' mathematical decisions and reflective processes.

Taken together, the synthesis supports a conceptual framework in which Islamic values provide the moral and spiritual orientation, MHoM offers opportunities to enact that orientation through mathematical activity, and character development represents a potential outcome of sustained enactment and reflection.

This framework contributes by connecting character education with the processes of mathematical thinking rather than treating them as separate educational goals. However, the reviewed literature primarily supports conceptual correspondences and pedagogical possibilities; it does not yet establish a causal pathway from Islamic values through MHoM to character development. Future research should therefore investigate how specific values are enacted through particular MHoM characteristics and whether these practices contribute to observable and sustained changes in students' character.

CONCLUSION

This systematic literature review suggests that integrating Islamic values and Mathematical Habits of Mind (MHoM) provides a complementary framework for character-oriented mathematics education. Theoretically, this integration extends conventional mathematics education frameworks by connecting ethical and spiritual orientations with cognitive dispositions and reflective mathematical practices. Among the Islamic values, *Ṣidq* (honesty), *Amānah* (responsibility), and *Istiqāmah* (consistency and perseverance), together with *Mujāhadah* (striving), *Tafakkur* (contemplation), and *Muḥāsabah* (self-reflection), offer important foundations for character development. These values correspond conceptually with MHoM dimensions, particularly persistence, reflective thinking, reasoning, and flexibility, which support sustained effort, justified problem-solving, and critical evaluation. However, these relationships represent conceptual associations rather than established causal links.

The predominantly descriptive and implementation-oriented nature of the reviewed studies, alongside limited longitudinal and causal research, restricts conclusions about the long-term effectiveness of this integration and the generalizability of its outcomes. Consequently, the proposed framework should be considered a conceptual foundation rather than an empirically validated model. Future research should employ longitudinal, mixed-methods, and comparative designs to examine how Islamic values and MHoM interact over time and contribute to students' mathematical thinking and character formation.

RECOMMENDATION

Based on these findings, mathematics educators should integrate Islamic values into mathematical activities through explicit and observable practices. For example, *Ṣidq* can be fostered by asking students to justify each solution step, report errors honestly, and verify their answers, while *Istiqāmah* and *Mujāhadah* can be encouraged through non-routine problems that require students to persist, compare alternative strategies, and reflect on unsuccessful attempts. Curriculum developers should incorporate these value–MHoM connections into textbook tasks, assessment rubrics, and teacher-training programs, emphasizing the enactment of values rather than their mere presentation as additional content.

Future research should test the proposed Islamic Values–MHoM–Character framework through quasi-experimental and longitudinal designs. Quasi-experimental studies could compare learning outcomes between classes using

explicitly integrated tasks and classes using conventional instruction, measuring Islamic-value enactment, MHoM dispositions, and character-related outcomes. Longitudinal studies could examine whether changes in these variables are sustained over time. Mediation analysis, supported by appropriate sample sizes and validated measures, could then test whether changes in MHoM statistically mediate the relationship between value-integrated instruction and character development. These approaches would provide stronger evidence for designing mathematics education that supports both mathematical competence and ethical–spiritual character.

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