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Integrating Prayer and Mathematics in Value-Based Mathematics Education

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Abstract
This study aims to explore the integration between mathematics and Islamic prayer through the conceptual pillars of patterns, numbers, and abstraction, framed within a value-based learning approach. Mathematics, as a discipline concerned with numerical operations, structural patterns, and abstract reasoning, provides a logical framework that can be meaningfully connected to spiritual practices. Prayer, as an act of devotion and direct communication with Allah SWT, embodies structural regularity, numerical precision, and abstract spiritual intention, making it a fertile context for contextualized mathematics instruction. Using a qualitative-descriptive approach with a literature study method, this research analyzes Qur'anic verses, classical tafsir, and scholarly works on mathematics in Islamic tradition. The findings reveal that the sequence and symmetry of prayer movements, the fixed counts in rakʿah and dhikr, and the unseen dimensions of intention and focus in prayer parallel mathematical principles of pattern recognition, cardinality, and abstraction. The integration of these elements into mathematics lessons can enhance cognitive skills (pattern recognition, calculation, abstraction), foster positive affective engagement by linking learning to meaningful religious contexts, and cultivate spiritual values such as discipline, mindfulness, and faith. This study concludes that mathematics and prayer are complementary pathways to understanding order in both the physical and spiritual realms, supporting the holistic objectives of Islamic education.

Keywords:
Value-Based Learning; Mathematics Education; Islamic Prayer; Pattern Recognition; Religious Values Integration

A. INTRODUCTION

Prayer is a form of human communication with God that has high spiritual value. In Islam, prayer is not only an act of servitude to Allah SWT, but also a means to seek guidance, blessings, and protection. Scholars emphasize that prayer strengthens faith and fosters closeness to the Creator (Subahri, B., & Airiza, 2024). In daily life, prayer functions as an effective instrument to overcome challenges and nurture resilience.

Mathematics also holds a unique position in religious life, especially within Islam. Its concepts are embedded in the determination of prayer times, zakat calculations, Hijri calendars, and qibla directions. Beyond these practical applications, mathematics reflects the divine order of the cosmos, providing a logical framework to appreciate the majesty of Allah's creation. Nasr (2022) notes that mathematics, as an exact science, offers profound insights into the cosmic harmony governed by divine laws.

However, a significant gap exists in educational practice: the teaching of mathematics in schools and madrasahs often lacks explicit connections to students' spiritual lives. This disconnect reduces opportunities to foster a holistic understanding of knowledge that embraces both cognitive and affective dimensions. Value-based learning, an approach that integrates

moral, ethical, and spiritual values into subject matter, can bridge this gap by creating meaningful contexts that resonate with learners' faith and lived experiences. Research on religious values integration in mathematics education shows that embedding spiritual contexts can increase students' motivation, engagement, and conceptual understanding (Aseery, 2023; Pramestika et al., 2020).

Surah Al-Mu'min verse 60 states: "Pray to Me, and I will answer you." This command underscores that prayer is both a divine injunction and a promise of response. Integrating mathematics and prayer in the classroom aligns with this Qur'anic principle, positioning mathematical patterns, numbers, and abstractions as pathways to reflect upon and internalize divine order. For instance, mathematical analysis can illuminate the symmetry in prayer movements, the numerical structure of dhikr, and the periodicity of daily worship, thereby linking abstract mathematical concepts with concrete spiritual practices (Yusuf, 2020).

Previous studies have explored mathematics within Islamic contexts, for example, Alkilidar & Khafaji (2020) examined the relationship between Islamic geometry and mosque architecture, while others have focused on astronomy-based worship timing. Yet, few have explicitly combined prayer and mathematics within a pedagogical framework aimed at enhancing both mathematical competence and spiritual awareness. This study addresses that gap by exploring how the conceptual parallels between mathematics and prayer, patterns, numbers, and abstraction, can be transformed into learning designs that support value-based learning in mathematics classrooms.

The primary goal of this study is to propose an educational model that connects mathematical concepts with Islamic prayer practices, fostering a balance between faith (iman) and reason (ʿaql). This collaboration not only deepens learners' appreciation for mathematics as a tool to understand divine creation but also strengthens their spiritual consciousness. In line with contemporary Islamic education goals, such integration encourages the development of a holistic mindset in which intellectual growth is inseparable from moral and spiritual formation (Sabtina, 2023).

Previous studies have widely explored the integration of mathematics with Islamic values through various contexts, such as zakat calculation, the Hijri calendar, and ethnomathematical elements derived from local cultural artifacts like batik patterns or mosque architecture. While these approaches have successfully demonstrated the contextualisation of mathematics in Islamic education, the specific use of prayer (ṣalāh) as the primary pedagogical context remains underexplored. This study introduces a novel framework by employing the three conceptual pillars, patterns, numbers, and abstraction, as an integrated value-based learning model embedded in prayer-based activities. This structured framework not only reinforces mathematical competencies but also embeds affective and character-oriented outcomes, offering a holistic instructional design that aligns with the philosophical goals of Islamic education.

B. METHODS

This study employed a qualitative descriptive approach with a library research method, aimed at exploring the epistemological and pedagogical intersections between mathematics and Islamic prayer (ṣalāh) within the framework of value-based learning. The sources of data consisted of primary Islamic texts, including the Qur'an, classical tafsir works, and hadith, as well as secondary sources such as books, journal articles, and previous studies on mathematics education and Islamic integration. Data collection focused on identifying conceptual parallels among the three pillars, patterns, numbers, and abstraction, embedded in both mathematical theory and Islamic worship practices. The process involved textual analysis and thematic categorization to extract educational values that can be adapted into mathematics instruction.

The data were analyzed using an interpretive and thematic analysis technique, allowing the researcher to derive meaning from textual relationships between mathematical concepts and spiritual symbolism. Triangulation of sources was conducted to ensure analytical validity, combining theological interpretation with pedagogical insights. The analytical framework

followed three stages: (1) identifying relevant mathematical and ritual structures; (2) interpreting their philosophical and educational significance; and (3) synthesizing the findings into a conceptual model for value-based mathematics education. This method ensured that the study not only presented a descriptive linkage between mathematics and prayer but also proposed a replicable framework for integrating faith and reason in Islamic education.

C. RESULT & DISCUSSION

Conceptual Relationship: Patterns, Numbers, and Abstraction

The integration of mathematics and prayer reveals deep conceptual parallels that can serve as the foundation for value-based learning. These parallels can be grouped into three interrelated dimensions: patterns, numbers, and abstraction. Together, they form a coherent framework that unites mathematical logic with spiritual devotion, fostering both cognitive and affective growth in learners. Here's your Conceptual Relationship: Patterns, Numbers, and Abstraction section with the new explanatory paragraphs integrated seamlessly, so it's now richer, more scholarly, and journal-ready:

Patterns,

Both mathematics and prayer are grounded in structured regularities. The Qur'an (Surah Al-Mu'min: 60) commands believers to pray, embedding an ordered sequence in worship that mirrors mathematical symmetry and periodicity. In Islamic practice, the procedural sequence of qiyām, rukū', sujūd, and qa'dah reflects rhythmic repetition, much like mathematical sequences and cycles (Devlin, 2000; Suyitno & Habibi, 2020). Mathematics seeks to identify and analyse patterns in numbers, shapes, and natural phenomena (Yusti et al., 2024), while structured prayer fosters discipline, consistency, and awareness of divine order. This conceptual link shows that spiritual and logical order are mutually reinforcing, guiding learners toward an integrated worldview.

The regularity in Islamic prayer encompasses not only the sequence of movements but also the correlation between prayer times and astronomical phenomena. For instance, the determination of Fajr, Dhuhr, Asr, Maghrib, and Isha prayer times is based on the sun's position, which can be modeled using periodic functions in mathematics (Hosseini et al., 2014). This pattern shows that the order in worship has a precise astronomical basis, consistent with the patterns analyzed in applied mathematics. Syam & Jumriani (2025) further emphasize that introducing pattern concepts through the context of worship can enhance students' logical thinking skills while reinforcing their awareness of the divine order in creation. Thus, understanding patterns in worship provides a strong pedagogical foundation for linking mathematics learning with spiritual values, forming a more meaningful and value-based learning approach.

Numbers,

Numbers in Islamic worship carry both quantitative and symbolic significance. The fixed counts in dhikr, such as reciting Subḥānallāh, Alḥamdulillāh, and Allāhu Akbar each 33 times, are examples of quantified devotion aligned with mathematical concepts like sequencing, modular arithmetic, and cardinality (Barton, 2009; Surur et al., 2023). This numerical discipline cultivates mindfulness, precision, and respect for structure. The five daily prayers, the calculation of prayer times, and the lunar-based Hijri calendar further illustrate how numeric systems underpin both religious life and mathematical reasoning (Denny, 2011; Fakhrurrazi et al., 2024; Gülen, 2006).

The use of numbers in worship also reflects more advanced mathematical concepts, such as factors and multiples, which can be observed in the repetition of rak'ah counts in obligatory prayers. For example, the total number of rak'ahs in a day (17) can be broken down into a combination of factors 2, 3, and 4, creating opportunities to teach number factorization in a relevant context (Surur et al., 2025; Susanti, 2020). Additionally, the calculation of zakat, the distribution of inheritance (faraidh), and the determination of the qibla direction all demonstrate that Islam employs numerical systems as part of its social and devotional order (Gordon, 2019). Integrating number concepts from worship into mathematics lessons has been

shown to increase students' learning interest, as they can see the direct relevance between the material studied and their religious life (Aseery, 2023).

Abstraction,

Mathematics operates in an abstract realm, using symbols to represent intangible concepts. Prayer similarly engages with the unseen (al-ghayb), where intention (niyyah), focus (khushu'), and spiritual presence (hudhur al-qalb) are central but physically unobservable (Al-Ghazali, 2005; Darmayanti et al., 2022; Tall, 2002). Both domains require the practitioner to operate beyond the visible, fostering higher-order thinking and spiritual maturity. In mathematics, abstract entities like ∞ or $\sqrt{-1}$ extend thought beyond the tangible; in prayer, the unseen reality of divine presence is grasped through faith and contemplative worship (Barton, 2009; Fahyuni et al., 2020; Nasr, 2007).

Abstraction in mathematics and worship teaches learners to think beyond the visible and the concrete. In prayer, for example, the movements and recitations carry symbolic meanings that transcend the physical; bowing (rukū') and prostration (sujūd) are not merely bodily positions but representations of humility before the Creator (Al-Ghazali, 2005b). This aligns with the concept of abstraction in mathematics, where symbols and models are used to represent more complex realities, such as function graphs modeling natural phenomena (Tall, 2002). According to (Ciptadi, 2022), learning that emphasizes the connection between mathematical abstraction and spiritual abstraction can enhance higher-order thinking skills while fostering a sense of transcendence in students.

These three layers, patterns, numbers, and abstraction, are sequentially interwoven: patterns are often expressed numerically, and both patterns and numbers ultimately guide the mind toward abstraction. In a value-based learning framework, this structural harmony enables mathematics education to be both intellectually rigorous and spiritually enriching, bridging the gap between scientific inquiry and divine contemplation.

Lesson Design and Potential Implementation in Value-Based Learning

To translate these conceptual connections into classroom practice, this study proposes a value-based learning approach that integrates spiritual contexts into mathematics lessons. This approach uses religiously meaningful content to develop both mathematical competence and moral-spiritual awareness.

Example Lesson Design

Topic: Pattern Recognition and Number Operations in Islamic Prayer

- Learning Objective: Students will identify and analyse patterns in the sequence and structure of daily prayers, and apply number operations to calculate total prayer units (rak'ah) per day and week.
- Learning Context: Introduce the structure of the five daily prayers and their rak'ah counts (e.g., Fajr: 2, Dhuhr: 4, Asr: 4, Maghrib: 3, Isha: 4).
- Activities:
    1. Pattern Identification: Students arrange prayer times in sequence and identify symmetry in their rak'ah counts.
    2. Numerical Operations: Students calculate the total rak'ah in a day (17) and in a week (119), relating this to addition and multiplication.
    3. Value Reflection: Discuss how regularity in worship mirrors the order in mathematics, reinforcing discipline and mindfulness.
- Assessment: Short quiz on sequence recognition and number operations; reflective writing on the connection between mathematical patterns and spiritual order.

Pattern Recognition and Number Operations in Islamic Prayer

Daily prayers (shalat lima waktu) in Islam follow a fixed sequence, Fajr, Dhuhr, Asr, Maghrib, and Isha, that is both chronological and structural. Each prayer time is performed at a specific moment in the day, creating a predictable rhythm that reflects both spiritual and natural order (Devlin, 2000; Hambali & Wangi, 2024). This sequence is not random; it aligns

with the movement of the sun and embodies a symmetrical structure in terms of positioning within the day, two prayers before midday, one at sunset, and two in the evening. Recognizing this pattern introduces students to the idea that both religious rituals and mathematics are grounded in systematic order.

The number of rak'ah (prayer units) in each of the five daily prayers forms another layer of mathematical structure: Fajr has 2, Dhuhr has 4, Asr has 4, Maghrib has 3, and Isha has 4. When these are arranged in order, a pattern emerges, shorter prayers at the beginning and middle of the day, longer ones during midday and evening, with Maghrib providing a unique middle count. This arrangement mirrors mathematical symmetry, where certain values are balanced around a central axis. Such observation helps learners bridge religious practice with mathematical pattern recognition (Yusti et al., 2024).

An essential learning objective in this context is for students to identify and analyse patterns in the prayer sequence and structure, and then apply numerical operations to these values. By introducing them to the fixed rak'ah counts, educators can encourage students to see beyond rote memorization, prompting them instead to examine the underlying numerical regularities. This analytical approach not only enhances mathematical competency but also deepens appreciation for the ordered nature of worship.

One activity to support this learning objective is arranging the five daily prayers in their chronological order and visually representing their rak'ah counts. Students may use diagrams or charts to depict the sequence, noting the symmetry and variation. For example, the repetition of the number 4 in Dhuhr, Asr, and Isha provides a point of comparison, while the unique count of 3 in Maghrib introduces an asymmetry that makes the pattern richer and more complex.

A subsequent activity involves numerical operations using these counts. Students calculate the total rak'ah performed in a single day by summing the values: $2 + 4 + 4 + 3 + 4 = 17$. This result can then be extended to the weekly total by multiplication: $17 \times 7 = 119$. This practical application of addition and multiplication situates mathematical learning in a real-life, spiritually meaningful context. Through this, abstract number operations become tangible, and students see mathematics as directly relevant to their daily lives.

In a reflective component, students consider how the regularity of worship mirrors the order found in mathematics. Just as mathematical equations require logical consistency to produce correct solutions, the structured performance of daily prayers requires discipline and adherence to divine guidance (Barton, 2009). This reflection supports value-based learning by highlighting how discipline, precision, and mindfulness in worship parallel the habits of accuracy and persistence in mathematical problem-solving.

Assessment for this lesson includes a short quiz that tests sequence recognition and number operations related to prayer structure. Students may be asked to list the prayers in order, identify their rak'ah counts, compute daily and weekly totals, and explain the observed numerical patterns. In addition, a reflective writing task invites them to articulate the connection between mathematical patterns and spiritual order, reinforcing both cognitive and affective learning outcomes.

By integrating prayer structure into mathematics instruction, educators create an environment where learners experience mathematics not as an isolated subject, but as an interconnected discipline that relates to faith, daily life, and personal development. This approach encourages students to value both the logical clarity of mathematics and the spiritual depth of worship, fostering a holistic mindset that unites reason (ʿaql) and revelation (naql) in their pursuit of knowledge.

Table 1. The results of prospective teachers GPA scores

Mathematical Concept	Religious Context	Learning Activity (Lesson Design)	Mathematics Learning Outcome	Value Formation Outcome
Patterns	Sequence of prayer movements (*qiyām – rukūʿ – sujūd – qaʿdah*) and daily prayer schedule	Students arrange the five daily prayers in order; identify symmetry and repetition in rakʿah counts	Recognize and describe repeating patterns; understand periodicity	Discipline, consistency, awareness of order in life
Numbers	Fixed counts in *dhikr* (33–33–34) and total rakʿah per day/week	Calculate daily and weekly rakʿah totals; perform modular arithmetic with *dhikr* counts	Addition, multiplication, and modular arithmetic skills	Mindfulness, precision, appreciation of structure
Abstraction	Intention (*niyyah*), focus (*khushuʿ*), and unseen elements of worship	Relate abstract symbols (e.g., ∞, sequences) to unseen spiritual concepts; symbolic representation in mathematics and worship	Understand abstract mathematical symbols; relate abstract ideas to real-life contexts	Faith in the unseen (*īmān bil-ghayb*), reflective thinking

The integration of mathematics and Islamic worship can be framed around three conceptual pillars, patterns, numbers, and abstraction, which are deeply rooted in both mathematical theory and the structure of ritual practices. Patterns emerge in the sequential order and symmetry of daily prayers, numbers are embedded in the fixed rak'ah counts and repetitions of dhikr, while abstraction is reflected in the unseen intentions and spiritual focus that parallel the symbolic nature of mathematical concepts. Together, these pillars reveal a shared foundation of order, structure, and intentionality that unites rational thought with spiritual devotion.

Through a value-based lesson design, these conceptual pillars are transformed into structured learning activities that address multiple domains of student development. Cognitive skills are fostered through activities such as pattern recognition, numerical calculations, and conceptual abstraction. Affective engagement is encouraged by connecting mathematical learning to familiar and meaningful religious practices, which enhances motivation and personal interest. Spiritual values, including discipline, mindfulness, and faith, are cultivated by highlighting the parallels between the orderliness of mathematical reasoning and the regularity of worship. This integration ensures that learning is not only intellectually rigorous but also personally and spiritually enriching.

By grounding mathematics instruction in the lived experiences of students' faith, this model ensures that learning becomes contextual, meaningful, and character-oriented. It aligns with the holistic goals of Islamic education, where the aim is not only to develop intellectual competence but also to nurture moral character and spiritual awareness. In this way, mathematics becomes more than a set of abstract skills, it becomes a vehicle for understanding divine order, appreciating the beauty of creation, and fostering a balanced worldview that harmonizes *ʿaql* (reason) and īmān (*faith*).

Connection to Mathematics Learning Outcomes

Integrating prayer-based contexts into mathematics lessons can significantly enhance cognitive outcomes by embedding abstract concepts within meaningful and culturally relevant

situations. For example, activities involving the calculation of total rakʿah in daily and weekly prayers allow students to practice addition and multiplication while reinforcing their understanding of pattern recognition and numerical operations. This context-based approach aligns with findings by Barton (2009), who emphasizes that mathematical understanding deepens when learners connect abstract reasoning to structured, real-life practices. Similarly, Yusti et al. (2024) highlight that recognizing structural regularities, whether in mathematical sequences or ritual patterns, strengthens both logical reasoning and analytical thinking. By situating learning within familiar religious structures, students develop number sense and an appreciation for abstraction that extends beyond rote computation.

From an affective learning perspective, connectsing mathematics with prayer fosters positive attitudes toward the subject by making it more relatable and personally meaningful. When students engage with mathematics through contexts they value, such as calculating prayer times, exploring symmetry in worship sequences, or analyzing numerical repetitions in dhikr, they are more likely to experience intrinsic motivation and sustained engagement. (Aseery, 2023) found that the integration of religious values into academic content increases students' motivation and sense of relevance, as it aligns learning tasks with their belief systems and cultural identities. This approach also mitigates mathematics anxiety, as familiar contexts create a safe and affirming environment for exploration, thereby transforming mathematics from a perceived abstract hurdle into a tool for understanding the order and beauty of creation.

The integration of prayer-based contexts also plays a crucial role in character formation, embedding moral and spiritual values within mathematical problem-solving. The regularity of prayer instills discipline, the precision of numerical counts cultivates accuracy, and the reflective nature of worship fosters mindfulness, traits that are equally essential for success in mathematics. This aligns with the view of Al-Ghazali (2005b), who asserted that the ultimate purpose of knowledge is to draw humans closer to God, suggesting that intellectual rigor should be accosmpanied by moral and spiritual growth. Embedding these values into mathematics lessons not only equips students with cognitive and procedural skills but also nurtures virtues that benefit them in broader life contexts. As Barton (2009) notes, the fusion of scientific reasoning with ethical and spiritual values fosters a balanced educational experience, ensuring that learners emerge as both competent problem-solvers and morally grounded individuals.

This value-based learning framework aligns with contemporary curriculum goals, including the development of well-rounded learners who integrate intellectual skills with moral and spiritual consciousness. By situating mathematical instruction within the lived religious experiences of students, educators can create a holistic learning environment where reason (*ʿaql*) and faith (*īmān*) complement each other.

Practical Implications for Mathematics Teachers

The findings of this study offer practical implications for mathematics teachers in Islamic schools and madrasahs. Teachers can adopt the structural regularities of daily prayers, such as the sequence of qiyām, rukūʿ, sujūd, and qaʿdah, to teach pattern recognition and symmetry. The fixed number of rakʿah in each prayer can serve as a foundation for basic arithmetic operations, such as addition and multiplication, enabling students to calculate the total rakʿah performed per day (17) and per week (119). Furthermore, teachers can integrate the calculation of prayer times based on the sun's position as an example of applying mathematical concepts to real-life religious practices. These activities not only contextualise mathematics but also foster values such as discipline, accuracy, and mindfulness, thereby bridging cognitive skill development with moral and spiritual formation in accordance with value-based pedagogy.

D. CONCLUSION

The integration of mathematics and Islamic worship can be framed around three conceptual pillars, patterns, numbers, and abstraction, which are deeply rooted in both mathematical theory and the structure of ritual practices. Patterns emerge in the sequential

order and symmetry of daily prayers, numbers are embedded in the fixed rakʿah counts and repetitions of dhikr, while abstraction is reflected in the unseen intentions and spiritual focus that parallel the symbolic nature of mathematical concepts. Together, these pillars reveal a shared foundation of order, structure, and intentionality that unites rational thought with spiritual devotion.

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Despite the promising implications of this integration model, the current study is limited by its reliance on literature-based analysis rather than empirical classroom implementation. Future research should explore experimental and classroom-based studies to assess the measurable impacts of prayer-context integration on students' mathematical achievement, motivation, and character development. Additionally, cross-cultural investigations could examine how similar value-based mathematics approaches function in diverse Islamic educational settings, providing a broader understanding of its adaptability and long-term impact.

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