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Numeracy literacy in mathematics education through murabahah-based contexts

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Abstract

Mathematical literacy, often conceptualized in this study as numeracy literacy rooted in financial contexts, requires meaningful learning experiences that connect mathematical concepts to real-life situations. One underexplored context is murabahah, a prominent Islamic finance contract that has been studied predominantly through normative legal lenses. This study examines the pedagogical potential of murabahah to strengthen numeracy skills in mathematics education. Utilizing an integrative literature review of classical fiqh sources, contemporary fatwas, and educational literature, this study is non-empirical and aims to construct a theoretical and pedagogical framework rather than conduct classroom trials. The findings reveal that murabahah inherently involves financial elements, such as cost price, profit margins, installments, and rebates, that map directly onto mathematical concepts and numeracy indicators. The primary contribution of this research is the development of a systematic pedagogical mapping connecting these components with learning activities and illustrative contextual tasks. These tasks support percentage reasoning, proportional thinking, and financial decision-making without claiming proven student learning outcomes. Furthermore, integrating murabahah reflects the values of transparency and fairness, which are aligned with maqāṣid al-sharī'ah. Ultimately, murabahah serves as a viable pedagogical tool for contextual mathematics learning and value-based education.

Keywords: Islamic Financial Literacy; Murabahah; Numeracy; Social Arithmetic

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INTRODUCTION

Following the PISA framework, mathematical literacy is defined as an individual's capacity to formulate, employ, and interpret mathematics across diverse real-world contexts, including financial situations (OECD, 2023).To maintain strict conceptual consistency, this study adopts mathematical literacy as the primary construct, operationalizing it directly through PISA's core cognitive processes (Stacey & Turner, 2014): *formulating* situations mathematically, *employing* mathematical concepts, and *interpreting or evaluating* mathematical outcomes (Nakypbek et al., 2025). Contemporary mathematics education

increasingly emphasizes contextual learning approaches that bridge abstract concepts with authentic experiences (Direktorat SMA, 2020). Within financial contexts, specifically involving Islamic financial transactions like *murabahah*, learners engage with percentages, proportions, and calculations (Kusumawati et al., 2021). Grounding financial tasks in this coherent framework enables students to develop quantitative reasoning and decision-making skills that extend beyond procedural computation to meaningful real-world applications.

One important source of authentic financial numeracy contexts is financial transactions involving prices, profits, discounts, and payment schemes. Within Islamic finance, *murabahah* offers a highly relevant financial context because it operates widely in daily economic practices and Islamic financial institutions. Terminologically, *murabahah* refers to a sale contract where the seller discloses the original purchase price and adds an agreed profit margin, making numerical information transparent (Usmani, 2002). This structure provides meaningful opportunities for learning percentage calculations, proportional reasoning, installment schemes, and social arithmetic through realistic situations. Its normative framework, anchored in classical jurisprudence, DSN-MUI Fatwa No. 04/DSN-MUI/IV/2000, and AAOIFI standards, establishes core transactional parameters (Billah, 2021; DSN-MUI, 2000a, 2000b). Specifically, components such as cost price, disclosed profit margins, and deferred installment agreements serve as the direct foundational basis for identifying mathematical concepts and designing pedagogical tasks.

The dominance of murabahah in Islamic financing is also evident in Indonesia (Musarrofa & Muttaqin, 2024; Prabowo, 2010). Data from the Financial Services Authority (OJK) shows that more than 50% of Islamic bank financing portfolios are based on murabahah contracts (Otoritas Jasa Keuangan, 2024). The dominance of murabahah in everyday financial transactions increases the relevance of using such contexts to develop students' financial numeracy and mathematical decision-making skills. This highlights the importance of studying murabahah not only from a legal perspective, but also from social and educational dimensions. The widespread use of murabahah makes it a meaningful context for contextual mathematics learning. Although murabahah is widely practiced, several studies report challenges related to the transparency of margins, installments, and rebate calculations (Anas, Irham et al., 2024; Ibrahim & Salam, 2021). These challenges indicate the importance of financial numeracy, as accurate interpretation and calculation of transaction information are essential for informed decision-making and transparency in financial transactions (Agustine & Hariyani, 2021).

Recent studies have begun to explore the integration of Islamic financial contexts into mathematics learning as a means of strengthening numeracy literacy and financial literacy. Mathematics tasks based on murabahah transactions have been developed to help students engage with percentages, profit margins, installment schemes, and other financial calculations in meaningful contexts (Kusumawati et al., 2022, 2024). Findings from these studies suggest that students understand mathematical concepts more effectively when learning activities are connected to financial situations that are familiar within their communities. From a contextual learning perspective, murabahah provides authentic opportunities for students to interpret quantitative information, make calculations, and evaluate financial decisions. In addition, such contexts encourage students to connect mathematical ideas with real-world economic practices, thereby supporting the development of practical numeracy skills and financial awareness.

Despite these developments, existing studies discuss murabahah mainly from legal and financial perspectives, while its potential for developing mathematical reasoning remains underexplored. Research on murabahah commonly emphasizes Shariah compliance and Islamic financial practices, whereas mathematics education studies tend to address numeracy literacy in broader and more general contexts (Al-Shatibi, 2003). Consequently, limited attention has been given to how murabahah situations can be transformed into mathematical modelling activities that require students to formulate, represent, and solve real-world problems mathematically (Kusumawati et al., 2022; OECD, 2023). While Kusumawati et al. (2024) successfully established a broader framework and task design for Islamic financial literacy, existing work has not yet explored the structural mapping of *murabahah* mechanisms. This study addresses this gap by utilizing *murabahah* as a specific pedagogical tool to bridge classical jurisprudence with numeracy indicators.

While Kusumawati, I.B et al. (2023) established foundational instructional designs and a Math-based Islamic Financial Literacy framework for general social arithmetic, existing studies have not systematically decomposed the internal mechanics of *murabahah* contracts into specific pedagogical design principles. Specifically, previous work lacks a detailed structural mapping of *murabahah* components, Sharia constraints, and their associated numeracy processes for task design. This study addresses this gap by identifying the mathematical concepts embedded in *murabahah* transactions, developing a pedagogical framework for integration, mapping these components to numeracy indicators, and designing contextual tasks. The novelty lies not in introducing Islamic finance to mathematics, but in translating the specific operational and compliance mechanics of *murabahah* into structured numeracy tasks.

Accordingly, this study examines: (1) embedded mathematical concepts, (2) numeracy indicator mapping, (3) contextual task design, and (4) support mathematical thinking and numeracy literacy.

METHODS

This study employs an integrative literature review as a qualitative document analysis method to explore the potential of *murabahah* applications in strengthening mathematical literacy. Data sources include contemporary Islamic finance literature, relevant sharia standards, contemporary fatwas, and research articles in the field of mathematics education. Searches focus mainly on contemporary academic works, with no reliance on original classical texts. A transparent search strategy is implemented, with academic databases searched around themes including murabahah's operating mechanism, profit margin, installment payments, and discounts. The researcher serves as the core research instrument, supported by a document analysis form to categorize and connect themes that link Islamic finance principles to mathematical concepts. The study proceeds through a four-step process: establishing search keywords, screening and categorizing literature sources, extracting core structural concepts, and matching numerical dimensions to arithmetic literacy indicators.

To resolve the lack of a specified target level and provide explicit traceability, the methodological scope is systematically expanded across three distinct educational tiers: junior secondary school, senior secondary school, and higher education. Specifically, junior secondary tasks focus on applying fundamental social arithmetic concepts, whereas senior secondary levels engage in deeper integration of mathematics and financial structures. Furthermore, higher education tiers analyze complex murabahah scenarios requiring advanced mathematical problem-solving. Each mapping dimension explicitly traces back to its foundational Sharia basis, mathematical rationale, PISA competency dimension, and specific pedagogical implications. This structured multi-tier approach ensures complete analytical transparency. Pedagogical objectives guide tasks.

To visualize these sequential phases clearly, the entire investigation is structured into a systematic procedural model. The structural progression of this qualitative inquiry is comprehensively mapped out in Figure 1.

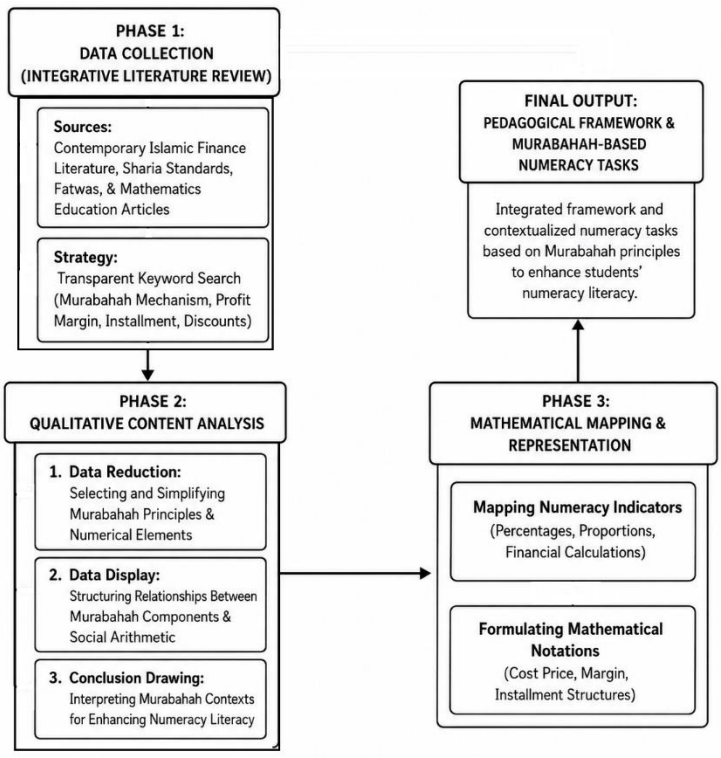


Figure 1. Workflow Diagram

As illustrated in Figure 1, the workflow outlines the systematic literature selection process. Sources were included if they explicitly addressed *murabahah* mechanisms, classical/contemporary *fiqh* rulings, or financial mathematics education, while studies focusing on non-commercial Islamic contracts or purely empirical classroom interventions without financial contexts were excluded to ensure rigorous alignment with normative commercial rules and pedagogical constructs.

The data analysis was carried out using a qualitative content analysis technique by integrating perspectives from Islamic legal theory and mathematics education. The analysis involved three main steps: data reduction, data display, and conclusion drawing. In the data reduction stage, information related to murabahah principles and numerical elements was selected and simplified. The data were then organized and presented in a structured form to highlight the relationship between murabahah components and social arithmetic concepts, such as percentages, proportions, and financial calculations. Finally, conclusions were drawn by interpreting how murabahah-based contexts can function as meaningful learning resources for enhancing numeracy literacy. To support the analytical process, several mathematical representations of murabahah calculations, such as cost price, margin, and installment structures, are expressed using standard mathematical notation written with Microsoft Equation

Editor and presented on separate lines where necessary, with numbering applied when used as references in the discussion.

RESULTS AND DISCUSSION

Murabahah as an Authentic Context for Numeracy Learning

Murabahah is one of the most widely recognized sale contracts in fiqh al-mu‘āmalāt and contemporary Islamic finance. Etymologically, the term derives from *ribḥ* (profit), while terminologically it refers to a sale transaction in which the seller discloses the original purchase price of a commodity and adds an agreed profit margin. Classical jurists from the Hanafi, Maliki, Shafi‘i, and Hanbali schools generally permit murabahah, provided that the transaction is conducted transparently and remains free from *gharar* (uncertainty) and *riba* (usury) (Faizin & Djayusman, 2023; Kahf, 2014). Its legitimacy is grounded in the Qur’an, hadith, and scholarly consensus, all of which emphasize fairness, honesty, and transparency in commercial transactions (Shah & Niazi, 2019). Consequently, murabahah occupies a strong position both in Islamic legal thought and in contemporary financial practice.

From a numeracy perspective, murabahah inherently contains multiple quantitative components that require mathematical reasoning and calculation. The contract involves explicit numerical elements such as cost price, profit margin, selling price, down payment, installment amount, and rebate, all of which must be clearly determined and communicated to the contracting parties (Hassan, 2020). The principle of transparency requires accurate calculations and clear disclosure of numerical information, making murabahah distinct from many other commercial transactions (Khalidin, Bismi, Armiadi Musa, 2023). These features create opportunities to engage with percentages, ratios, proportional relationships, arithmetic operations, and financial calculations. Therefore, murabahah provides a naturally structured context in which mathematical concepts are embedded within realistic economic activities.

The educational relevance of murabahah is strengthened by its widespread use in contemporary Islamic finance. In Indonesia, murabahah dominates Islamic banking financing portfolios due to its low risk, predictable returns, and fixed installments for customers, though this concentration limits its broader macroeconomic benefits for the real sector (Y. Saputra, 2026), making it one of the most familiar financial transactions encountered by Muslim communities (Handayani et al., 2025). Empirical studies also show diverse applications of murabahah, including financing schemes involving *wakālah* arrangements and support for micro, small, and medium enterprises (Parnawi et al., 2023). Because students are likely to

encounter similar financial practices in their families and communities, murabahah offers an authentic context that connects classroom mathematics with everyday economic experiences. Such contextualization can increase students' engagement and help them recognize the practical value of mathematical knowledge in real-life decision making.

In addition, contemporary developments in murabahah transactions provide rich opportunities for mathematical investigation and modelling (Niss & Blum, 2020). Changes in fiscal regulations, such as the abolition of Value Added Tax (VAT), have influenced transaction patterns, margins, and financing efficiency in Islamic banking (Setiawan et al., 2022). At the same time, debates surrounding profit-margin determination, annuity-based financing, arrangement fees, and compliance with AAOIFI standards illustrate the importance of interpreting quantitative information critically (Siswantoro, 2021). These situations require learners not only to perform calculations but also to analyze assumptions, compare alternatives, and evaluate financial decisions (Spooner, 2024). As a result, murabahah can function as an authentic context for developing numeracy literacy, mathematical reasoning, and mathematical modelling competencies within meaningful and socially relevant situations.

Mapping Murabahah Components to Mathematical Concepts

Murabahah provides a rich context for connecting financial transactions with school mathematics because its core components involve explicit numerical relationships. Unlike many everyday transactions, murabahah requires transparent disclosure of the cost price, profit margin, selling price, installment amount, and other payment-related information, making quantitative reasoning central to the contract (Ascarya, 2012). These characteristics create opportunities to transform murabahah from a purely financial transaction into a pedagogical resource for numeracy learning. Rather than focusing solely on legal compliance, mathematics education can utilize murabahah contexts to help students interpret numerical information, calculate percentages, compare financial alternatives, and make informed decisions. Consequently, the numerical structure of murabahah can be systematically mapped to mathematical concepts and numeracy literacy indicators commonly emphasized in contemporary mathematics curricula.

To translate Islamic commercial mechanisms into instructional design, Table 1 presents a conceptual mapping connecting *murabahah* components to mathematical concepts and numeracy indicators. This mapping was derived through a systematic qualitative analysis of classical *fiqh* literature and contemporary financial regulations, aligning each transactional element with core curriculum standards.

Table 1. Conceptual Mapping of Murabahah Components to Mathematical Concepts and Numeracy Indicators

Murabahah Component	Mathematical Concept	Numeracy Indicator	Learning Activity	Sample Task
Cost Price	Whole Number Operations	Interpret numerical information	Identify base value	Determine purchase cost
Profit Margin	Percentage	Percentage reasoning	Calculate markup	Find 15% profit margin
Selling Price	Addition & Percentage	Financial calculation	Compare prices	Compute final price
Down Payment	Fraction & Percentage	Represent part-whole relation	Analyze payment structure	Calculate remaining balance
Installment	Division & Proportion	Proportional reasoning	Monthly payment planning	Determine installment amount
Rebate	Percentage Decrease	Evaluate financial decisions	Early settlement analysis	Calculate rebate value

The analytical procedure for this mapping involved examining the mathematical properties inherent in each financial variable. For instance, percentage and proportional reasoning were linked to profit margins and installment schedules because these structures require multiplicative comparisons. Similarly, whole number operations and financial calculations were mapped to cost and selling prices, ensuring that every pedagogical element accurately reflects both commercial principles and mathematical learning objectives.

As shown in Table 1, each component of murabahah corresponds to a specific mathematical concept and numeracy competency. Cost price serves as the starting point for numerical interpretation, while profit margins introduce percentage reasoning and financial calculations. Selling prices require students to integrate arithmetic operations with percentage concepts, whereas down payments and installments involve part-whole relationships, proportional reasoning, and division. Rebate calculations further extend learning opportunities by engaging students in percentage decreases and financial decision-making. These relationships reflect actual murabahah practices involving installment structures, payment timing, and settlement options (Andini, 2020). Therefore, murabahah can function not only as a financial transaction but also as a coherent pedagogical framework for developing numeracy literacy through authentic mathematical experiences.

Murabahah-Based Numeracy Tasks

The pedagogical value of murabahah can be strengthened through the development of contextual numeracy tasks derived from authentic financial situations. Context-based tasks enable students to connect mathematical concepts with real-life experiences, thereby enhancing both numeracy literacy and financial understanding. The numerical structure of murabahah, including cost price, profit margin, selling price, down payment, installments, and rebates, provides opportunities to design learning activities across different cognitive levels. Following contemporary numeracy frameworks, tasks can range from routine calculations to reasoning and decision-making problems that require interpretation of financial information (OECD, 2023). The following examples translate *murabahah* practices into meaningful tasks aligned with the PISA framework, specifically addressing how students formulate, employ, and interpret mathematical concepts in financial situations.

Profit margin is one of the most fundamental numerical elements in murabahah because it requires students to understand percentages and their application in financial transactions. In classroom learning, margin-related tasks help students interpret numerical information, calculate markups, and determine selling prices based on agreed profit rates. Such activities support percentage reasoning while introducing students to authentic financial calculations found in everyday economic practices (Saputra, 2024). At the basic level, students apply percentage formulas directly to determine the profit amount and final selling price. This task primarily involves employing straightforward procedures and basic arithmetic operations. Nevertheless, it provides an essential foundation for developing advanced financial reasoning and interpretation skills. Through this foundational process, students actively formulate the mathematical relationship between the cost price and the profit rate to employ percentage calculations. Ultimately, they learn to interpret the resulting financial figures within realistic commercial scenarios.

Task 1: *An Islamic financial institution purchases a refrigerator for a disclosed cost price of Rp4,000,000 and agrees to resell it to a customer with a transparent 15% profit margin over a 12-month tenure with fixed monthly installments.* ***Question:*** *Calculate the final selling price, determine the monthly installment amount, and evaluate whether the seller's margin disclosure meets the principle of financial transparency in a murabahah contract.*

Installment calculations introduce additional mathematical concepts, particularly division and proportional reasoning. In murabahah financing, the selling price and payment period are determined at the beginning of the contract, ensuring that the installment amount remains fixed

throughout the repayment period (Kusumawati et al., 2021). This characteristic provides a practical context for understanding equal distribution and financial planning. Students learn to translate a total obligation into periodic payments and evaluate the implications of different payment durations.

Task 2: *An agreed murabahah selling price of Rp4,800,000 for a motorcycle is to be paid over a fixed tenor of 12 months with equal monthly installments.* ***Question:*** *Determine the exact monthly installment amount, explain how real-world rounding or remainder adjustment should be handled in the final payment, and evaluate the practical implications of this payment structure for the customer's monthly budgeting.*

Task 3*: Based on DSN-MUI Fatwa No. 13/DSN-MUI/IX/2000 regarding down payments (urbun) in murabahah transactions, a bank sets a required down payment of 20% calculated strictly from the agreed selling price of Rp5,000,000 for a home appliance.* ***Question:*** *Calculate the exact down payment amount, determine the remaining balance to be financed under the installment scheme, and evaluate how this initial payment structure aligns with the principle of financial risk mitigation for both parties.*

Murabahah also includes more advanced financial situations involving rebates and alternative financing options. A rebate may be granted when a customer settles the remaining debt earlier than scheduled, reducing the total amount payable (Ijtahidah & Nisa', 2023). Calculating rebates requires students to determine percentage decreases and evaluate financial consequences. At a higher level, students can compare alternative murabahah schemes involving different margins and payment periods. Such activities move beyond procedural calculation toward analysis and evaluation, requiring students to justify decisions using quantitative evidence (Nawi et al., 2018).

Task 4: *A customer with a remaining debt of Rp3,000,000 intends to pay off their murabahah financing ahead of schedule. Referring to DSN-MUI Fatwa No. 23/DSN-MUI/III/2002 and DSN-MUI Fatwa No. 153/DSN-MUI/VI/2022 regarding early settlement (ibra'), the bank decides to grant a discretionary 10% rebate on the remaining obligation.* ***Question:*** *Calculate the final early settlement amount to be paid by the customer, and explain why this rebate is a voluntary incentive rather than an automatic contractual right under Islamic financial regulations.*

Task 5: *A customer wishes to finance a motorcycle with a disclosed cost price of Rp15,000,000 using one of two murabahah options compliant with Islamic banking principles:*

- *Option A: A 15% total profit margin with a long-term repayment tenor of 24 months.*
- *Option B: A reduced 10% total profit margin with a short-term repayment tenor of 12 months.*

Question: *Compute the total selling price and the exact monthly installment for both Option A and Option B. By comparing the total financial obligation against monthly budget affordability, determine which option is more economical and justify your recommendation using mathematical calculations and financial reasoning.*

Taken together, these tasks illustrate how murabahah contexts can support multiple dimensions of numeracy literacy. Taken together, these tasks illustrate how *murabahah* contexts can provide valuable opportunities and theoretical support for developing mathematical literacy. Rather than demonstrating direct learning gains, these designed tasks serve as pedagogical tools that offer structured pathways for students to engage with authentic financial reasoning. Students are required not only to perform calculations but also to interpret quantitative information, analyze financial situations, and make evidence-based decisions. The progression from percentage calculations to comparative reasoning reflects increasing levels of cognitive demand, ranging from LOTS to HOTS. Moreover, the tasks integrate key numeracy competencies emphasized in contemporary mathematics education, including percentage reasoning, proportional thinking, financial calculation, and decision making (Murdani & Mulyana, 2024). Consequently, murabahah-based tasks provide a practical mechanism for linking school mathematics with authentic financial experiences while simultaneously strengthening financial literacy and numeracy development.

Development of Mathematical Thinking Through Murabahah Contexts

Murabahah contexts provide meaningful opportunities for developing mathematical reasoning through arithmetic thinking. Mathematical reasoning involves the ability to interpret numerical information, identify relevant relationships, and justify calculations using appropriate mathematical concepts. In murabahah transactions, students must determine profit margins, selling prices, and discounts based on available numerical data. For example, calculating a 15% profit margin on a cost price requires understanding percentage operations and their implications for the final selling price. Similarly, rebate calculations involve determining percentage reductions from an outstanding balance (Kusumawati et al., 2021). These activities encourage students to move beyond mechanical computation and explain how results

are obtained. As a result, murabahah-based learning can strengthen arithmetic thinking while promoting conceptual understanding of percentages, markups, and financial calculations commonly encountered in everyday economic transactions (Kamaruddin et al., 2025).

Murabahah also supports the development of proportional reasoning, particularly through installment calculations. Proportional reasoning refers to the ability to understand multiplicative relationships and compare quantities in a meaningful way. In murabahah financing, the total selling price is distributed across a predetermined repayment period, requiring students to determine installment amounts based on the duration of the contract. Because the profit margin is fixed at the beginning of the agreement, installment values remain constant throughout the repayment period (Syahriani et al., 2024). Students therefore engage with concepts of division, equal distribution, and proportional relationships between total obligations and payment periods. Such activities help learners understand how changes in financing duration influence payment structures while maintaining a constant selling price. Consequently, murabahah contexts provide authentic situations for developing proportional reasoning within financial settings.

Another key dimension of mathematical thinking is mathematical modelling, which reflects the complete modelling cycle. Specifically, these tasks require students to identify relevant quantities in *murabahah* transactions, formulate mathematical relationships between cost and selling prices, solve the resulting models, and interpret the mathematical results within a realistic Islamic financial context rather than simply applying routine algebraic recall.

Let CP represent the disclosed cost price of the asset, M the agreed absolute profit margin, and SP the final selling price. Under the operational constraints of murabahah governance, where the seller must transparently disclose both the acquisition cost and the explicit profit margin percentage (r), the fundamental formulation of the financial structure is expressed as:

$$SP = CP + M$$

When incorporating the margin rate (r) as a proportional parameter of the acquisition cost, the relationship is generalized into the structural model:

$$SP = CP(1 + r)$$

Within this modeling framework, students must progress through the complete competency cycle: defining variables and cost-disclosure assumptions, executing the calculation model, interpreting the resulting financial figures in terms of affordability

and fairness, and evaluating the model's suitability against transparency principles in Islamic finance.

These representations enable students to identify variables, formulate mathematical expressions, and analyze how changes in one variable affect others. Through modelling activities, learners connect abstract mathematical concepts with authentic financial transactions, thereby strengthening their ability to formulate and solve real-world problems mathematically (Choiriyah et al., 2024).

Murabahah contexts further promote quantitative reasoning by encouraging students to examine relationships among multiple variables within a transaction. Quantitative reasoning involves interpreting numerical information, identifying patterns, and understanding how quantities interact with one another. In murabahah, the cost price, profit margin, selling price, down payment, installment amount, and rebate are interconnected variables. A change in the margin rate directly affects the selling price, while adjustments in down payments influence the remaining financed amount and subsequent installments. Likewise, rebate policies alter the final settlement value when customers repay earlier than scheduled (Pramesti, D. P., & Novarianti, 2024). Analyzing these relationships helps students understand that financial calculations are not isolated procedures but part of an integrated quantitative system requiring logical interpretation and reasoning.

The development of quantitative reasoning ultimately supports financial numeracy and decision making. Modern mathematics education emphasizes not only computational proficiency but also the ability to evaluate alternatives and make informed judgments using quantitative evidence (OECD, 2020). Murabahah contexts provide opportunities for students to compare financing options, assess the effects of different profit margins, evaluate installment plans, and determine the financial consequences of early settlement (Syafiah, Z., Gampito, G., & Andriany, 2025). For example, learners may compare two financing schemes with different margins and repayment periods to identify the most economical option. Such tasks require students to justify conclusions using mathematical arguments rather than intuition alone. Therefore, murabahah-based learning contributes to the development of mathematical thinking by integrating reasoning, modelling, quantitative analysis, and decision making within authentic financial contexts relevant to students' daily lives.

Contribution to Numeracy Literacy and Mathematics Education

Murabahah offers potential pedagogical benefits for mathematical literacy by embedding authentic quantitative situations that encourage students to interpret, calculate, and evaluate numerical information (OECD, 2023). Unlike standard commercial arithmetic, the governance of Islamic financial contracts provides superior pedagogical productivity because mandatory price transparency forces learners to rigorously account for cost price, profit margins, down payments, rebates, and strict installment structures. This unique framework fosters mathematical reasoning and proportional thinking that conventional profit-loss contexts rarely trigger, as students must navigate moral constraints alongside mathematical calculations (Tiana et al., 2023). Furthermore, contextual learning materials grounded in religious values successfully bridge abstract arithmetic operations with meaningful decision-making (Sari & Rahmawati, 2023). Consequently, embedding these structured financial constraints into instructional tasks transforms routine calculations into powerful vehicles for enhancing both functional numeracy and deeper mathematical understanding among learners.

Critical analysis reveals distinct pedagogical advantages and inherent constraints when utilizing these Sharia-compliant models over standard commercial problems. The requirement for explicit cost disclosure prevents ambiguity, allowing students to critically evaluate financial fairness rather than merely performing algorithmic computations. However, potential student misconceptions often arise when learners struggle to differentiate between voluntary early settlement rebates and mandatory contractual obligations, or when they misinterpret margin rates as simple interest (Nofiansyah & Ekawati, 2023). Addressing these cognitive hurdles requires structured scaffolding that encourages critical thinking and active evaluation, which aligns with broader instructional strategies aimed at improving conceptual mastery (Azzahra et al., 2023). Thus, rigorous analytical engagement. Truly elevates learning.

Beyond numeracy development, murabahah contributes significantly to contextual learning in mathematics education. Contextual learning emphasizes the connection between mathematical concepts and students' lived experiences, enabling learners to construct meaning through authentic situations. As a financial practice familiar to many Muslim communities, murabahah offers realistic scenarios involving purchasing decisions, profit calculations, installment planning, and financial obligations. Previous studies indicate that contextual financial tasks improve students' engagement and conceptual understanding because learners can relate mathematical ideas to situations they encounter outside the classroom (Kusumawati et al., 2021; Risdiyanti et al., 2019). The integration of murabahah into mathematics learning

therefore supports the principles of contextual education by linking abstract mathematical concepts with meaningful economic experiences, thereby increasing the relevance and applicability of school mathematics.

From a mathematics education perspective, this study contributes by proposing an interdisciplinary framework that connects fiqh al-muʿāmalah with numeracy learning. Existing murabahah studies have predominantly focused on legal validity, Sharīʿah compliance, and institutional implementation, while mathematics education research has rarely explored Islamic financial contexts as learning resources (Choiriyah et al., 2024; Mundir, 2018). By identifying mathematical concepts embedded in murabahah transactions and mapping them to numeracy literacy indicators, this study demonstrates how Islamic financial practices can be transformed into educational resources. The proposed framework expands the range of contextual learning materials available to teachers and provides a systematic approach for integrating mathematical concepts such as percentages, ratios, proportions, and social arithmetic into authentic financial situations (Brunner & Star, 2024). As a result, murabahah is positioned as a pedagogically meaningful context rather than merely a legal or economic topic.

Furthermore, this study contributes to mathematics education by providing practical guidance for curriculum development, task design, and classroom implementation. The proposed murabahah-based numeracy tasks illustrate how real-world financial transactions can be used to develop mathematical reasoning, modelling, quantitative analysis, and decision-making skills (Pratiwi et al., 2024). Such an approach is consistent with educational policies that encourage the use of authentic contexts in mathematics learning, including the principles emphasized in Indonesia's Kurikulum Merdeka (Kemendikbudristek, 2024). In addition, contextual economic learning has been shown to improve student achievement and engagement in mathematics (Aishalya et al., 2022; Surur, Kuswandi, et al., 2025). Therefore, the integration of murabahah into mathematics education not only enriches learning resources but also provides an innovative pathway for developing numeracy literacy through culturally relevant and educationally meaningful financial contexts.

Supporting Islamic Values and Financial Literacy

Murabahah provides a meaningful contribution to financial literacy because it introduces learners to authentic financial concepts that are commonly encountered in everyday economic activities. Understanding murabahah requires individuals to interpret numerical information related to cost prices, profit margins, selling prices, down payments, installments, and rebates (Belzer & Grotlüschen, 2022). Such calculations encourage learners to develop practical

financial skills that support informed economic decision-making. Studies indicate that stronger Islamic financial literacy improves individuals' ability to understand financing products and make sound financial choices within Islamic economic systems (Murdani & Mulyana, 2024; Nawi et al., 2018; Surur, Pujilestari, et al., 2025). Through murabahah-based learning activities, students are not only trained to perform financial calculations but also to evaluate financial obligations and alternative payment options. Consequently, murabahah serves as an effective context for strengthening both numeracy literacy and financial literacy simultaneously.

Beyond financial competence, murabahah embodies important Islamic values that can be integrated into educational practice. The contract is founded upon principles of transparency, fairness, honesty, and the prohibition of riba, all of which are central to Islamic economic ethics. From the perspective of maqāṣid al-sharī'ah, murabahah contributes to the protection of wealth (ḥifẓ al-māl) by ensuring transparent transactions and reducing the risk of exploitation (Khattak, 2018). It also supports the preservation of life (ḥifẓ al-nafs) by promoting financial practices that avoid oppressive interest-based arrangements (Syahriani et al., 2024). Furthermore, the requirement to understand costs, margins, and payment structures encourages analytical thinking, thereby contributing to the preservation of intellect (ḥifẓ al-'aql) (Surur, Tsani, et al., 2025; Syahriani et al., 2024). These values demonstrate that murabahah is not merely a financial mechanism but also a vehicle for ethical and character education.

The integration of murabahah into mathematics learning therefore offers a dual educational benefit by combining numeracy development with value-based learning (Purba et al., 2026). Through contextual tasks involving margins, installments, rebates, and financial comparisons, students engage in mathematical reasoning while simultaneously learning the ethical principles embedded in Islamic finance. This approach aligns with broader maqāṣid-oriented objectives that emphasize justice, transparency, and responsible wealth management in society (Admin, 2024; Kamaruddin et al., 2025; Laldin & Furqani, 2013). In educational settings, murabahah can function as a bridge connecting mathematics, financial literacy, and Islamic values within a single learning context. As a result, students develop not only quantitative competencies but also a deeper understanding of ethical financial behavior, making mathematics learning more meaningful, relevant, and socially responsible.

CONCLUSION

This study concludes that murabahah serves as an authentic and viable pedagogical context for enhancing mathematical literacy within mathematics education. Rather than

demonstrating empirical gains in student learning, the research highlights the theoretical potential of framing Islamic commercial contracts as instructional tools. By systematically addressing the initial research objectives, the investigation successfully identifies key embedded mathematical concepts, such as percentage calculations, proportional reasoning, and financial arithmetic, inherent in cost prices, profit margins, and installment schemes. Furthermore, the study establishes a comprehensive mapping connecting these commercial variables to specific numeracy indicators, thereby providing a structured framework for instructional design. The development of illustrative contextual tasks demonstrates how students can be guided through mathematical modeling and quantitative evaluation without relying on routine algebraic exercises. Ultimately, this pedagogical mapping bridges financial practices with value-based education, offering educators a robust conceptual model to foster both quantitative competence and ethical awareness through structured learning activities.

Beyond its contributions to structural mapping, the integration of murabahah into mathematics learning reflects core ethical principles aligned with maqāṣid al-sharī‘ah, including transparency, fairness, and responsible wealth management. While the proposed tasks and pedagogical frameworks have not yet been empirically implemented in classrooms, they offer valuable theoretical opportunities for students to engage in critical financial reasoning and decision-making. Future educational initiatives can build on this foundational work by testing these contextual tasks in real classroom settings to assess their practical impact on student performance. In summary, this conceptual study bridges the gap between Islamic financial instruments and curriculum design, providing a meaningful alternative for contextual mathematics learning that merges cognitive skill development with socially responsible financial ethics.

This study adopts a qualitative descriptive research design combined with an integrative literature review to explore the potential of the Islamic finance cost-plus financing model, Murabahah, to strengthen arithmetic literacy in relevant practical scenarios. The study draws on contemporary Islamic finance literature, related Shariah standards, modern fatwas, and research papers in mathematics education, limiting its sources to contemporary academic works rather than classical original texts. It conducts transparent retrieval of specified keywords from academic databases, treats the researcher as the core research tool, and uses a document analysis form to identify cross-cutting themes. It completes literature screening and classification, as well as concept extraction and mapping in accordance with standardized research procedures.

The findings further indicate that murabahah supports the learning of several important mathematical concepts commonly taught in school mathematics. Percentage calculations are used to determine profit margins and rebates, while ratios and proportions are used to analyze payment structures and installment schemes. Installment calculations provide opportunities to develop division skills, proportional reasoning, and financial planning abilities. More broadly, murabahah contexts encourage financial numeracy by requiring students to analyze quantitative information, compare alternatives, and make informed decisions. Through these activities, learners engage not only in procedural computation but also in mathematical reasoning, modeling, interpretation, and decision-making. Therefore, murabahah serves as a comprehensive context for fostering mathematical thinking and practical numeracy competencies simultaneously.

A major contribution of this study is the development of a pedagogical mapping that systematically connects murabahah components with mathematical concepts, numeracy literacy indicators, learning activities, and classroom tasks. The proposed mapping clarifies how concepts such as percentage, proportion, financial calculation, and quantitative reasoning can be taught through authentic murabahah situations. Consequently, the numeracy tasks developed in this study serve as preliminary instructional resources that require further empirical validation and classroom testing before practical implementation. These tasks range from routine percentage calculations to higher-order reasoning activities involving rebates, installment planning, and comparative financial decisions. Accordingly, the mapping framework and task designs offer useful instructional resources for integrating contextual financial situations into mathematics learning.

Despite these contributions, several important limitations of this study must be explicitly acknowledged. First, the proposed conceptual mapping and contextual numeracy tasks have not yet been tested in an actual classroom setting. Second, the assignment designs currently lack empirical data regarding authentic student cognitive responses. Furthermore, because the study does not include empirical implementation across educational levels, the broader applicability of the proposed pedagogical mapping and tasks across different educational contexts remains to be examined. Finally, real-world murabahah financial transactions were necessarily simplified for pedagogical purposes. Future studies should empirically examine these instructional designs across various classrooms. Researchers must expand frameworks.

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