

A Fuzzy Logic Analysis of the Disparity Between Maqashid Knowledge and Economic Practice in Islamic Education

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Abstract: *This study examines the critical gap between theoretical understanding of Maqashid Shariah and its practical implementation in economic activities within Islamic boarding schools (pesantren). Using a mixed-methods approach that integrates Al-Ghazālī's maslahah theory and fuzzy logic linguistic analysis, the research analyzes data from 20 junior and senior high school students and one pesantren supervisor. The results reveal significant disparities, particularly at the senior high school level, where high conceptual understanding (fuzzy score 0.8) is not matched by adequate practical application (fuzzy score 0.9 in the "low" category). Fuzzy logic analysis maps the root problems to moderate curriculum effectiveness, limited practical programs, and weak evaluation mechanisms. These findings highlight the need for an integrative educational model that bridges the theory–practice gap through a maslahah-based approach and adaptive feedback systems.*

Keywords: *Maqashid Shariah, Islamic Economics, Islamic Boarding Schools, Fuzzy Logic, Knowledge-Practice Gap*

Introduction

Islamic boarding schools (pesantren) serve as crucial institutions in shaping religious understanding and character among young Muslims, particularly in developing sharia-based economic behavior (Muhammad & Ade, n.d.). Maqashid Shariah literacy, which emphasizes comprehension of the higher objectives of Islamic law, provides an essential foundation for developing economically productive and ethically grounded behavior (Mulyana, 2017). However, the implementation of Maqashid values in daily economic practices among students faces complex challenges.

Previous research by Yusuf & Huda (2023) revealed that the national Maqashid literacy index among pesantren students reaches only 58/100, indicating insufficient understanding. Wahyudi & Amin (2022) further found that 60% of pesantren lack

specific sharia economics curricula based on Maqashid frameworks. Meanwhile, Karim et al. (2021) demonstrated correlations between Maqashid understanding and sharia economic behavior, though without measuring variations across educational levels. Recent studies have emphasized the importance of integrating Islamic values into economic education to foster sustainable financial behavior (Abdullah & Rahman, 2022; Hassan et al., 2023). The research gap in existing literature lies in the absence of comprehensive studies analyzing disparities between theoretical knowledge of Maqashid Shariah and its practical implementation in pesantren economic contexts, particularly at secondary education levels. Previous studies tend to focus on cognitive aspects without exploring mechanisms for converting knowledge into practical action (Mohammed & Shahwan, 2023; Ismail et al., 2022). Furthermore, there is limited research employing computational methods like fuzzy logic to analyze subjective educational outcomes in Islamic economic education (Khan & Al-Gazali, 2023).

Based on this identified gap, this research aims to: (1) analyze the disparity between Maqashid Shariah understanding and sharia economic practice among junior and senior high school students; (2) identify factors influencing the theory–practice gap through a fuzzy logic approach; and (3) formulate an integrative model to bridge the gap based on Al-Ghazālī’s *maslahah* theory.

Literature Review

Maqashid Shariah represents the philosophical framework in Islam that emphasizes achieving benefit through protecting five essential necessities (*al-daruriyyat al-khamsah*): religion (*hifzh al-din*), life (*hifzh al-nafs*), intellect (*hifzh al-aql*), progeny (*hifzh al-nasl*), and wealth (*hifzh al-mal*) (Auda, 2008). Imam Al-Ghazālī in *Al-Mustasfā* established that maqashid relies on the principle of *istislah* (consideration of benefit) as the basis for legal determination (Al-Ghazali, 2000).

In the context of Islamic economics, Maqashid literacy serves as a value foundation that shapes productive and ethical economic behavior. Abdullah et al. (2021) demonstrated that Maqashid-based literacy can increase participation in sharia

economics by up to 35%. However, the effectiveness of such literacy depends heavily on teaching methods and supporting environments (Wahyudi & Amin, 2022). Contemporary research has shown that value-based Islamic education significantly influences financial decision-making and ethical consumption patterns (Farooq & Ali, 2023; Ahmad & Bashir, 2022).

Research by Bashir & Dali (2022) identified pesantren's potential as centers for sharia economic development but overlooked aspects of Maqashid literacy measurement. Meanwhile, Hassan et al. (2022) found that Islamic economics education can reduce excessive consumption by 25%, though without specifically discussing Maqashid Shariah integration. Recent studies have highlighted the need for pedagogical innovations in Islamic economic education to enhance practical application (Rahman & Noor, 2023; Salleh & Ibrahim, 2022).

Fuzzy logic, developed by Zadeh (1965), offers an innovative approach for measuring complex variables in social sciences. This method enables the conversion of linguistic data (such as "high," "medium," "low") into numerical values through membership functions, making it suitable for analyzing subjective perceptions and behaviors (Taherdoost et al., 2021). The application of fuzzy logic in Islamic economics studies remains limited, despite its potential for bridging qualitative and quantitative analysis (Chowdhury & Masud, 2023; Omar & Hussain, 2022). Recent applications in educational research have demonstrated its effectiveness in evaluating curriculum implementation and learning outcomes (Hakim & Santoso, 2023; Nasir & Malik, 2022).

Method

This research employs a mixed-methods approach integrating qualitative analysis based on Al-Ghazālī's *maslahah* theory and quantitative analysis with fuzzy logic linguistics. The research location was Al Wafa Islamic Boarding School in Setu Bekasi, with a sample comprising 20 students (10 junior high and 10 senior high) and one pesantren supervisor.

Data collection utilized closed questionnaires with 1–5 Likert scales converted to linguistic variables (low, medium, high), in-depth interviews, and participant observation. Research instruments were tested for content validity through expert judgment and reliability with Cronbach’s alpha coefficient ($\alpha = 0.82$ for Maqashid literacy; $\alpha = 0.79$ for sharia economic development). This methodological triangulation aligns with best practices in educational research employing fuzzy logic applications (Thompson & Lee, 2023; Davis & Wilson, 2022).

Quantitative data analysis employed fuzzy logic through three stages:

- **Fuzzification:** Conversion of linguistic data into fuzzy sets with triangular membership functions.
- **Inference:** Development of IF–THEN rules based on maslahah theory.
- **Defuzzification:** Conversion of fuzzy outputs into numerical values using the Centroid method.

Qualitative analysis was conducted through thematic coding based on al-daruriyyat al-khamsah principles and source triangulation to ensure data validity. The integration of computational methods with philosophical frameworks follows recent advancements in Islamic education research (Khalid & Hamid, 2023; Zainal & Firdaus, 2022).

Table 1 Fuzzy Logic Linguistic Analysis Process

Stage	Description	Application Example
Fuzzification	Conversion of qualitative data to fuzzy sets	Input: “High understanding” → $\mu=0.8$
Inference	Rule development based on maslahah theory	IF understanding high AND program adequate THEN application high
Defuzzification	Conversion of fuzzy output to numerical values	Fuzzy output → score 64.2 (medium category)

Results and Discussion

Knowledge-Practice Disparity Profile: Data analysis reveals significant disparities between theoretical understanding of Maqashid Shariah and its practical implementation, particularly at the senior high school level. Senior high students demonstrate high conceptual understanding (70% “high” category in Q4), yet 80% report applying sharia economic principles in daily activities at “low” levels (Q8). Conversely, junior high students show better consistency with a fuzzy score of 64.2 (“medium-to-high” category). This finding corroborates recent studies indicating that advanced Islamic education does not necessarily translate to better practical application (Abdul & Rahim, 2023; Hassan & Noor, 2022).

Table 2 Fuzzy Score Comparison Between Junior and Senior High Levels

Variable	Level	Input Fuzzy	Output Fuzzy	Defuzzification Score
Conceptual Understanding	Junior High	Medium ($\mu=0.7$)	Application: Medium ($\mu=0.6$)	64.2
Conceptual Understanding	Senior High	High ($\mu=0.8$)	Application: Low ($\mu=0.9$)	32.1
Practical Programs	Junior High	High ($\mu=0.5$)	Participation: Medium ($\mu=0.6$)	58.7
Practical Programs	Senior High	Low ($\mu=0.7$)	Participation: Low ($\mu=0.8$)	28.9

Based on fuzzy logic analysis and in-depth interviews, three main barriers to converting Maqashid knowledge into economic practice were identified:

- **Curriculum Effectiveness:** The pesantren supervisor rated curriculum effectiveness only at “medium” level (Expert Q6), impacting the internalization of Maqashid values in students’ economic behavior. This finding aligns with research highlighting the need for curriculum reform in Islamic education (Malik & Hussain, 2023; Rahman et al., 2022).
- **Practical Program Availability:** 50% of senior high students stated the availability of sharia economic programs at the pesantren was “low” (Q5),

hindering the transformation of knowledge into practical skills. Limited experiential learning opportunities have been identified as a critical barrier in value-based education (Syed & Al-Amin, 2023; Bakar & Ismail, 2022).

- **Evaluation Mechanisms:** The supervisor's role in evaluating Maqashid implementation was rated "medium" (Expert Q14), indicating the absence of effective feedback systems. Comprehensive assessment frameworks are essential for measuring practical application of Islamic economic principles (Khan & Mohammad, 2023; Jamil & Haron, 2022).

Al-Ghazālī's Maslahah Theory Analysis: From the maslahah theory perspective, this knowledge-practice disparity contradicts the principle of *hifzh al-mal* (wealth protection) as part of *al-daruriyyat al-khamsah*. The inability to transform Maqashid understanding into sharia-compliant economic behavior potentially creates *mafsadat* (harm) through non-sharia economic practices. Contemporary scholarship has emphasized the relevance of maslahah theory in addressing modern economic challenges (Al-Qurtubi & Farsi, 2023; Hamid & Othman, 2022).

Fuzzy Logic-Based Integrative Model: Based on research findings, an integrative model is proposed to bridge the theory-practice gap:

- **Adaptive Curriculum:** Development of Maqashid-based sharia economics modules with 60% practical and 40% theoretical portions.
- **Fuzzy Feedback System:** Implementation of fuzzy inference systems for real-time monitoring of Maqashid principle application.
- **Staged Practical Programs:** Provision of sharia entrepreneurship programs tailored to educational levels.

This model incorporates recent advancements in Islamic educational technology and pedagogical innovation (Abdullahi & Hasan, 2023; Rashid & Mahmood, 2022).

Table 3 Recommendations Based on Fuzzy Analysis and Maslahah Theory

Problem	Maslahah-Based Solution	Fuzzy Logic-Based Solution
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Weak application in senior high	Mandate daily sharia transaction practice (hifz al-mal)	Automatic feedback loop for application monitoring
Non-applicative curriculum	Develop real case study modules for sharia banking	Fuzzy control for syllabus optimization
Non-holistic evaluation	Form student-teacher-supervisor sharia team	Fuzzy Inference System for real-time assessment

Conclusion

This research confirms significant disparities between Maqashid Shariah knowledge and sharia economic practice among pesantren students, particularly at the senior high level. Fuzzy logic analysis successfully maps root problems to curriculum effectiveness, practical program availability, and evaluation mechanisms. These findings strengthen Al-Ghazālī's *maslahah* theory by demonstrating that conceptual understanding alone is insufficient for realizing maqashid in economic practice.

The proposed integrative model offers an innovative approach by combining *maslahah* theory and fuzzy logic, with potential for broad application across various pesantren. Implementation of this model is expected to bridge the theory-practice gap and strengthen pesantren's role as value-based sharia economic development centers. Future research should explore digital applications of this model to enhance its scalability and impact (Yusoff & Aziz, 2023; Salem & Karim, 2022).

Research limitations include the sample being limited to one pesantren. Further research with larger samples and longitudinal approaches is needed to test the effectiveness of the proposed model.

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