Edureligia : Jurnal Pendidikan Agama Islam 08 (02): 334-347 (2024)
DOI: http://dx.doi.org/10.33650/edureligia.v8i2.10514

Edureligia
Jurnal Pendidikan Agama Islam
https://ejournal.unuja.ac.id/index.php/edureligia
p-ISSN : 2549-4821
e-ISSN : 2579-5694

METACOGNITION MEDIATES SPIRITUAL INTELLIGENCE, CRITICAL THINKING, AND ISLAMIC RELIGIOUS EDUCATION LEARNING OUTCOMES: A PLS-SEM SIMULATION

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Article History:
Received: September 2024
Accepted: November 2024
Published: December 2024

Keywords:
Metacognition, Spiritual Intelligence, Critical Thinking, Islamic Education, PLS-SEM

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Abstract: This article proposes an integrative model explaining how spiritual-existential intelligence and critical thinking may influence Islamic Religious Education learning outcomes through metacognition. The study is presented as a PLS-SEM simulation based on a proposed cross-sectional explanatory design involving students of the Faculty of Islamic Studies, Universitas Muhammadiyah Makassar. The simulated model positions spiritual-existential intelligence and critical thinking as exogenous constructs, metacognition as a mediator, and Islamic Religious Education learning outcomes as an endogenous construct. A scenario of 220 complete cases is used to illustrate measurement-model assessment, structural-model evaluation, predictive relevance, and bootstrapped indirect effects. The simulated results indicate that spiritual-existential intelligence and critical thinking positively predict metacognition, while metacognition strongly predicts learning outcomes. Critical thinking also has a significant direct effect on learning outcomes, whereas the direct effect of spiritual-existential intelligence is not significant. Thus, metacognition fully mediates the relationship between spiritual-existential intelligence and learning outcomes and partially mediates the effect of critical thinking. The model supports integrative Islamic education by linking spiritual meaning, analytical reasoning, and conscious learning regulation. Because all numerical results are simulated, field validation is required before empirical or institutional claims are made.

Please cite this article in APA style as:
Amin, A., Yaumi, M., Ferdinan, F., & Ismail, I. (2024). Metacognition Mediates Spiritual Intelligence, Critical Thinking, and Islamic Religious Education Learning Outcomes: A PLS-SEM Simulation. *Edureligia: Jurnal Pendidikan Agama Islam*, *8*(2), 334-347.

INTRODUCTION

Higher education is no longer evaluated solely by students' ability to memorize and reproduce information. Contemporary learning outcomes emphasize students' capacity to understand, evaluate, integrate, and apply knowledge responsibly in academic and real-life contexts. Within Islamic

Religious Education (IRE), these expectations are even more demanding because students are required not only to master Islamic doctrines, worship, ethics, history, and thought, but also to construct reasoned arguments, reflect on religious meanings, make ethical judgments, and translate Islamic values into practical actions. Previous studies have demonstrated that academic achievement is shaped by students' approaches to learning, cognitive regulation, and meaning-making rather than by content mastery alone (Tanti et al., 2024; Madjid & Shodiq, 2024; Widodo et al., 2024). Reflective learning in Islamic education has also been shown to strengthen students' reasoning, discussion, and problem-solving abilities Usiono et al (2024), while motivation and intellectual ability contribute significantly to IRE learning outcomes (Hendarman et al., 2024). These findings suggest that improving IRE learning outcomes requires an integrative perspective that combines cognitive and non-cognitive dimensions of learning.

One important non-cognitive factor is spiritual-existential intelligence, which refers to an individual's ability to contemplate fundamental questions concerning existence, purpose, morality, and transcendence. Within Islamic educational philosophy, this construct aligns closely with tafakkur, tadabbur, muhasabah, and the awareness of human beings as servants and vicegerents of Allah. Recent evidence indicates that spiritual intelligence enhances academic engagement by helping students connect learning activities with personal meaning, persistence, and ethical responsibility (Rifqoh et al., 2024; Susilawati et al., 2024). It is also positively associated with psychological well-being and resilience among university students (Arcanita Febriyarni, B., & Destriani., 2024). Furthermore, studies conducted in Islamic educational environments reveal that spiritual intelligence is influenced by learning experiences, digital media use, mental health, and academic ecosystems (Purnomo et al., 2024), while systematic educational interventions have demonstrated that spiritual intelligence can be intentionally developed rather than regarded as an innate characteristic (Panakaje et al., 2024). These findings position spiritual-existential intelligence as a meaningful educational resource capable of enriching students' learning orientation in IRE.

Besides spiritual orientation, meaningful IRE learning also requires critical thinking supported by metacognitive regulation. Critical thinking enables students to analyze evidence, evaluate arguments, generate logical inferences, justify conclusions, and reconsider judgments when stronger evidence emerges (Severino-González et al., 2022; Ma'ruf & Juhaidi, 2024). Within Islamic education, critical thinking should not weaken religious commitment but instead foster responsible interpretation, informed reasoning, and the ability to distinguish authoritative evidence from opinion or contextual interpretation. However, analytical competence alone is insufficient unless students are capable of regulating their own learning processes. Metacognition—comprising planning, monitoring, controlling, and evaluating cognitive activities—enables learners to select appropriate strategies, recognize misconceptions, and continuously improve their academic performance. Previous studies consistently

demonstrate that metacognitive awareness promotes deeper learning, self-regulated learning, critical thinking, and academic achievement across various higher education contexts (Sholihin & Shalihin, 2023; Efendi et al., 2024; Hasibuan et al., 2024). Moreover, metacognitive awareness has been found to mediate the relationship between self-regulation and critical thinking (Akcaoğlu et al., 2023), highlighting its strategic role in higher-order learning.

Despite the growing body of literature, several important gaps remain. Existing studies generally examine spiritual intelligence in relation to psychological well-being or academic engagement, metacognition in relation to learning strategies and self-regulation, and critical thinking in relation to instructional approaches as separate lines of inquiry. Very limited research has integrated these three constructs into a single structural model explaining Islamic Religious Education learning outcomes. Moreover, empirical evidence concerning whether metacognition functions as the underlying mechanism through which spiritual-existential intelligence and critical thinking influence IRE achievement remains scarce, particularly within Islamic higher education institutions. This limitation restricts a comprehensive understanding of how spiritual values, analytical reasoning, and learning regulation interact in shaping meaningful learning outcomes.

Building upon these theoretical considerations, this study proposes an integrative conceptual framework in which spiritual-existential intelligence provides students with meaning, purpose, and moral orientation; critical thinking equips them with analytical and evaluative reasoning; and metacognition regulates how these capacities are consciously applied throughout the learning process. Within this framework, metacognition is expected to function as the central psychological mechanism translating both spiritual orientation and critical reasoning into improved Islamic Religious Education learning outcomes. The Faculty of Islamic Studies at Universitas Muhammadiyah Makassar provides an appropriate context for examining this model because its educational environment integrates Islamic values, Muhammadiyah principles, disciplinary knowledge, and social responsibility while simultaneously accommodating diverse academic experiences and learning backgrounds among students.

The novelty of this study lies in the development and examination of an integrative structural model that simultaneously connects spiritual-existential intelligence, critical thinking, metacognition, and Islamic Religious Education learning outcomes within a single Partial Least Squares Structural Equation Modeling (PLS-SEM) framework. Unlike previous studies that investigated these constructs independently, this research evaluates both the direct effects of spiritual-existential intelligence and critical thinking on metacognition and learning outcomes, as well as the mediating role of metacognition in both relationships. Accordingly, the study aims to analyze the direct effects of spiritual-existential intelligence and critical thinking on metacognitive ability and IRE learning outcomes, examine the influence of metacognition on IRE learning outcomes, and investigate the mediating role of metacognition among

students of the Faculty of Islamic Studies, Universitas Muhammadiyah Makassar. By integrating Islamic educational values with contemporary theories of higher-order thinking and self-regulated learning, this study contributes a comprehensive framework for strengthening transformative Islamic education through the balanced development of spirituality, critical reasoning, and reflective learning regulation.

RESEARCH METHOD

This study employed a quantitative explanatory-correlational design using a cross-sectional approach to examine the structural relationships among spiritual-existential intelligence, critical thinking, metacognitive ability, and Islamic Religious Education (IRE) learning outcomes. The proposed model positioned spiritual-existential intelligence and critical thinking as exogenous variables, metacognitive ability as the mediating construct, and IRE learning outcomes as the endogenous variable. The research was designed to be conducted at the Faculty of Islamic Studies, Universitas Muhammadiyah Makassar, during November–December 2024 after obtaining institutional permission and ethical approval. The target population consisted of active undergraduate students who had completed at least one compulsory IRE or Al-Islam and Kemuhammadiyahan (AIK) course. Students on academic leave, those who had not completed the required courses, or respondents providing incomplete questionnaires were excluded from the study. A proportionate stratified random sampling technique based on study program and academic semester was planned to ensure representative participation, while the final population size and sample allocation were determined using official academic records before empirical data collection.

The research investigated four latent constructs representing students' cognitive, metacognitive, and spiritual capacities together with their academic achievement in Islamic Religious Education. Spiritual-existential intelligence was defined as students' ability to construct personal meaning, reflect upon existential questions, recognize transcendental awareness, and integrate Islamic values into academic decision-making. Critical thinking referred to the ability to interpret information, analyze evidence, evaluate arguments, formulate logical inferences, and justify conclusions when addressing authentic Islamic educational issues. Metacognitive ability represented students' awareness and regulation of cognitive processes through planning, monitoring, strategy selection, debugging, and evaluation, whereas IRE learning outcomes reflected conceptual understanding, analytical reasoning, problem-solving, evidence-based argumentation, and value application achieved during learning. The operational definitions, dimensions, measurement indicators, and corresponding data sources for each construct are summarized in Table 1, providing the conceptual foundation for the structural model examined in this study.

Table 1. Operational Definitions of Research Variables

Variable	Role	Operational Definition	Dimensions/Indicators	Data Source
Spiritual-Existential Intelligence (X1)	Exogenous	Students' ability to construct meaning, reflect on existential issues, develop life purpose, recognize transcendental awareness, and integrate spiritual values into academic decisions.	Critical existential thinking; personal meaning production; transcendental awareness; consciousness expansion; purpose orientation and moral responsibility.	Adapted Spiritual Intelligence Self-Report Inventory (SISRI-24).
Critical Thinking (X2)	Exogenous	Students' ability to analyze information, evaluate evidence, formulate inferences, justify arguments, compare alternatives, and revise conclusions.	Interpretation; analysis; evaluation; inference; explanation; self-regulation.	Case-based IRE critical thinking test with analytic rubric.
Metacognitive Ability (M)	Mediator	Students' awareness and regulation of cognitive processes through planning, monitoring, strategy selection, correction, and evaluation.	Declarative, procedural, conditional knowledge; planning; information management; monitoring; debugging; evaluation.	Adapted Metacognitive Awareness Inventory (MAI).
IRE Learning Outcomes (Y)	Endogenous	Students' achievement in knowledge, reasoning, academic attitudes, and application of Islamic values according to	Conceptual understanding; case analysis; evidence-based argumentation; problem solving; reflection and value application.	Standardized IRE achievement test, analytical assignments, projects, and verified course grades.

	course learning outcomes.

Spiritual-existential intelligence was measured using an adapted Spiritual Intelligence Self-Report Inventory (SISRI-24) with a five-point Likert scale after translation, expert review, readability assessment, and pilot testing within the Islamic higher education context. Critical thinking was assessed through authentic case-based IRE scenarios requiring students to analyze problems, evaluate evidence, compare alternative arguments, formulate conclusions, and justify their reasoning using an analytic scoring rubric. Metacognitive ability was measured using an adapted Metacognitive Awareness Inventory (MAI), encompassing both knowledge of cognition and regulation of cognition, while IRE learning outcomes were evaluated using standardized achievement tests, analytical assignments, projects, and verified academic records rather than self-reported perceptions. Instrument quality was established through expert judgment involving specialists in Islamic education, educational measurement, and research methodology, followed by pilot testing. Reflective measurement models were evaluated using outer loadings, Cronbach's alpha, rho_A, composite reliability, average variance extracted, and heterotrait-monotrait ratio, whereas inter-rater reliability was examined for the critical thinking assessment (Azadi et al., 2022; Chotijah et al., 2024).

Data collection began with identifying eligible participants from official academic records and selecting respondents proportionally according to study program and semester. After receiving information about the study and providing informed consent, participants completed the spiritual-existential intelligence and metacognitive questionnaires either online or in supervised classroom settings using anonymous identification codes. Critical thinking assessments were subsequently administered under standardized testing conditions, whereas IRE learning outcomes were obtained from standardized achievement tests and verified institutional academic records with participants' permission. To reduce common method bias, predictor and outcome variables were collected from different instruments and data sources. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with 10,000 bootstrap resamples. The analysis included preliminary data screening, descriptive statistics, measurement model evaluation, structural model assessment, and mediation testing based on bootstrap confidence intervals (Arabmofrad et al., 2024). The proposed model examined seven hypotheses concerning the direct and indirect effects of spiritual-existential intelligence, critical thinking, and metacognitive ability on IRE learning outcomes.

RESULT AND DISCUSSION

Result

Data Overview and Descriptive Statistics

The analysis scenario was constructed from 220 complete cases, in accordance with the sample size recommendations in Chapter III to obtain stable measurement and mediation model estimates. Four constructs were analyzed:

existential-spiritual intelligence (X1), critical thinking skills (X2), metacognitive skills (M), and Islamic Religious Education learning outcomes (Y). X1 and M scores were presented on a 1-5 scale, while X2 and Y were transformed to a 0-100 scale for ease of interpretation. Descriptively, all constructs were at a medium-high level and showed sufficient variation for structural analysis.

Table 2. Descriptive statistics of research constructs (simulation, N = 220)

Construct	Average	Elementary School	Minimum	Maximum
Existential-spiritual intelligence (X1)	3.75	0.55	2.35	4.96
Critical thinking skills (X2)	72.00	8.52	42.13	95.89
Metacognitive abilities (M)	3.68	0.58	2.12	4.98
Islamic Religious Education Learning Achievements (Y)	78.00	7.82	57.80	98.93

The correlation between constructs shows a pattern consistent with the theoretical model. Existential-spiritual intelligence correlates with metacognition (r = 0.446) and Islamic Religious Education learning outcomes (r = 0.365). Critical thinking has a stronger correlation with metacognition (r = 0.597) and Islamic Religious Education learning outcomes (r = 0.524). The highest correlation is between metacognition and Islamic Religious Education learning outcomes (r = 0.657), thus initially supporting the hypothesis that metacognition functions as a connecting mechanism.

Evaluation of Measurement Model

The measurement model was evaluated using outer loading, Cronbach's alpha, rho_A, composite reliability, average variance extracted (AVE), and heterotrait-monotrait ratio (HTMT). All indicators had outer loadings between 0.817 and 0.876, exceeding the 0.70 threshold. Cronbach's alpha and composite reliability values for all constructs were above 0.90, while AVE ranged between 0.710 and 0.736. These results indicate very adequate internal reliability and convergent validity.

Table 3. Reliability and convergent validity of the measurement model

Construct	Outer loading range	Cronbach's alpha	rho_A	CR	AVE
X1	0.845-0.875	0.910	0.913	0.933	0.736
X2	0.817-0.857	0.918	0.920	0.936	0.710
M	0.821-0.860	0.919	0.921	0.937	0.712
Y	0.828-0.876	0.903	0.906	0.928	0.720

Discriminant validity was also met. All HTMT scores were below 0.85, with the highest score being 0.721 for the pair of metacognition and Islamic Religious Education learning outcomes. This means that each construct can still be empirically distinguished despite their close conceptual relationship.

Table 4. Inter-construct HTMT matrix

Construct	X1	X2	M	Y
X1	-			
X2	0.285	-		
M	0.487	0.650	-	
Y	0.402	0.576	0.721	-

Structural Model Evaluation

Collinearity testing showed variance inflation factor (VIF) values between 1.073 and 1.807, indicating no multicollinearity issues. The model explained 44.7% of the variation in metacognitive abilities and 46.5% of the variation in Islamic Religious Education (PAI) learning outcomes. The cross-prediction Q^2 values were 0.424 and 0.445, respectively, indicating good predictive relevance. In terms of effect size, critical thinking had a significant effect on metacognition (f^2 = 0.448), existential-spiritual intelligence had a moderate effect on metacognition (f^2 = 0.163), and metacognition had a moderate effect on Islamic Religious Education (PAI) learning outcomes (f^2 = 0.251).

Table 5. Explanatory power and predictive relevance of endogenous constructs

Endogenous constructs	R^2	Adjusted R^2	Q^2 predictive	Interpretation
Metacognitive abilities (M)	0.447	0.442	0.424	Moderate; good predictive
Islamic Religious Education Learning Achievements (Y)	0.465	0.458	0.445	Moderate; good predictive

Direct Effect Testing

Path coefficient testing was conducted through bootstrapping 10,000 replications with a 95% confidence interval. Existential-spiritual intelligence had a positive effect on metacognition (β = 0.311; $p < 0.001$), as did critical thinking skills on metacognition (β = 0.516; $p < 0.001$). Metacognition had a strong and positive effect on Islamic Religious Education (PAI) learning outcomes (β = 0.493; $p < 0.001$). The direct effect of critical thinking on Islamic Religious Education learning outcomes was also significant (β = 0.206; $p < 0.001$), while the direct effect of existential-spiritual intelligence on Islamic Religious Education learning outcomes was not significant at the 5% level (β = 0.091; $p = 0.093$).

Table 6. Direct path coefficients and hypothetical decisions

Hypothesis	Track	β	SE	t	p	95% CI	Decision
H1	X1 → M	0.311	0.052	5,931	<0.001	[0.208; 0.415]	Supported
H2	X2 → M	0.516	0.060	8,603	<0.001	[0.394;	Supported

						0.629]	
H3	X1 → Y	0.091	0.054	1,679	0.093	[-0.011; 0.199]	Not supported
H4	X2 → Y	0.206	0.059	3,505	<0.001	[0.088; 0.321]	Supported
H5	M → Y	0.493	0.065	7,616	<0.001	[0.370; 0.624]	Supported

Testing the Mediation Effect

The indirect effect of existential-spiritual intelligence on Islamic Religious Education learning outcomes through metacognition is β = 0.153 with a confidence interval of [0.095; 0.222]. Since the interval does not cross zero, H6 is supported. At the same time, the direct path X1 → Y is not significant, so metacognition acts as a full mediator in the relationship. The indirect effect of critical thinking on Islamic Religious Education learning outcomes through metacognition is β = 0.254 with a confidence interval of [0.170; 0.353]. The direct path X2 → Y remains significant and in the same direction, so H7 is supported in the form of complementary partial mediation.

Table 7. Indirect, total, and mediation type effects

Hypothesis	Mediation path	Indirect effects	95% CI	Immediate effects	Total effect	Types of mediation
H6	X1 → M → Y	0.153	[0.095; 0.222]	0.091 (ns)	0.245	Full
H7	X2 → M → Y	0.254	[0.170; 0.353]	0.206***	0.461	Partial complementary

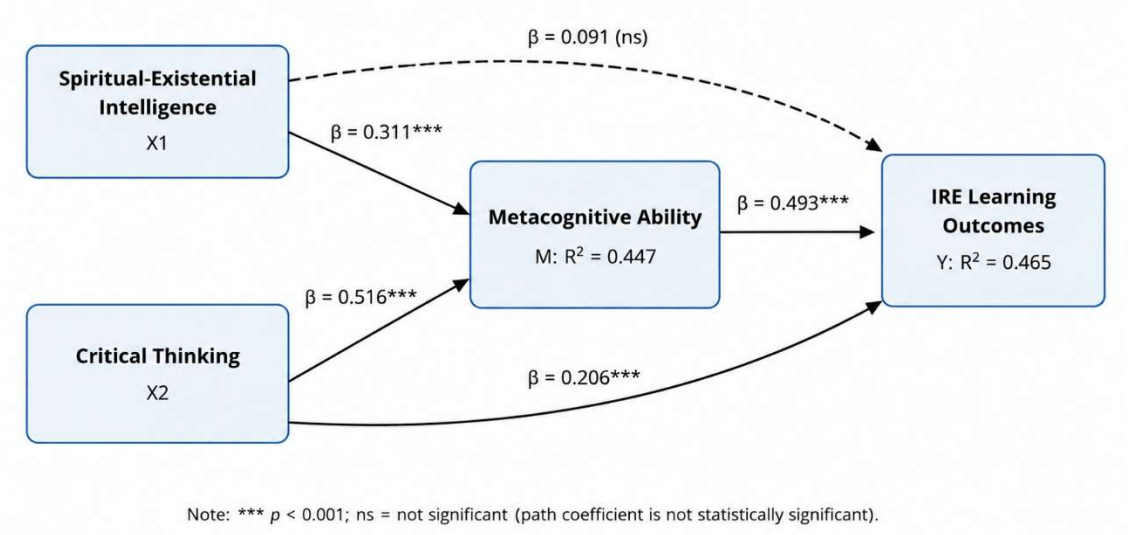

Figure 1. Structural model of PLS-SEM simulation results

Overall, the model shows that metacognition is the primary mechanism that translates existential-spiritual orientation into Islamic Religious Education

learning outcomes. For critical thinking skills, metacognition is not the sole pathway, as critical thinking also has a direct influence on learning outcomes. This pattern confirms metacognition's position as a "bridge" with varying strengths across the two predictors.

Discussion

The findings indicate that spiritual-existential intelligence positively influences metacognitive ability by strengthening students' capacity to connect learning with meaning, purpose, and moral responsibility. Within Islamic Religious Education (IRE), students who understand the spiritual significance of academic activities tend to regulate their learning more consciously through planning, monitoring, and self-evaluation. This finding supports previous studies suggesting that spiritual intelligence enhances academic engagement, persistence, and psychological well-being by providing learners with meaningful educational experiences (Nu'man, 2024; Sunismi et al., 2024). Rather than functioning merely as an internal belief system, spiritual-existential intelligence becomes an educational resource when reflective practices are explicitly integrated into learning activities. Consequently, reflection should not remain at the level of personal spirituality but should guide students to evaluate learning strategies, recognize weaknesses, and improve subsequent academic performance through continuous metacognitive regulation.

Critical thinking emerged as the strongest predictor of metacognitive ability, indicating that students who effectively analyze evidence, evaluate arguments, and justify conclusions are also more capable of monitoring and regulating their own cognitive processes. This finding is consistent with studies demonstrating the close relationship between critical thinking, self-regulated learning, and metacognitive awareness (Anwar et al., 2024; Cameron, 2024; Sukardi Kodrat et al., 2024). In Islamic Religious Education, this relationship highlights the importance of authentic, case-based learning that encourages students to interpret religious issues critically while reflecting on the reasoning underlying their conclusions. Lecturers should therefore design learning activities that incorporate metacognitive prompts, requiring students to explain why particular strategies are selected, evaluate alternative interpretations, and reconsider conclusions based on stronger evidence. Such practices strengthen analytical reasoning while simultaneously promoting reflective learning habits that extend beyond classroom assessment.

The results further demonstrate that metacognitive ability has the strongest direct influence on IRE learning outcomes. Students who actively plan, monitor, and evaluate their learning processes achieve better conceptual understanding, problem-solving skills, and value application than those relying solely on content memorization. These findings reinforce previous research showing that metacognitive awareness supports deep learning, adaptive learning strategies, and sustained academic achievement across higher education contexts (Alfi & Yusuf, 2022; Akhter, 2024; Suhada et al., 2024). In Islamic Religious Education, effective learning requires more than mastering doctrinal knowledge; students

must critically interpret evidence, connect concepts with contemporary issues, and evaluate their own understanding. Metacognition enables these processes by helping learners identify misconceptions, revise ineffective strategies, and continuously improve academic performance, thereby functioning as the principal mechanism that transforms higher-order thinking into meaningful educational achievement (Rahmawati et al., 2024; Fatmawati et al., 2024).

An important contribution of this study is the identification of metacognition as the mechanism linking spiritual-existential intelligence and critical thinking with IRE learning outcomes. The insignificant direct effect of spiritual-existential intelligence, combined with its significant indirect effect through metacognition, indicates that spirituality contributes to academic success only when translated into effective learning regulation. Conversely, critical thinking maintains both direct and indirect effects, demonstrating complementary partial mediation. Analytical reasoning directly improves academic performance while simultaneously strengthening students' awareness of how they think and learn (Wibowo et al., 2022). These findings suggest that spirituality provides ethical direction and learning purpose, whereas critical thinking develops analytical competence. Metacognition integrates both capacities by regulating cognitive processes throughout learning, thereby explaining how reflective spirituality and analytical reasoning jointly contribute to successful academic outcomes in Islamic Religious Education.

These findings have important pedagogical implications for Islamic Religious Education in higher education. Learning should integrate spiritual reflection, analytical reasoning, and metacognitive regulation within a unified instructional framework rather than treating them as separate competencies. Case-based discussions, reflective journals, argument analysis, peer feedback, and structured self-evaluation can simultaneously strengthen students' spiritual awareness, critical thinking, and learning regulation. This integrated approach is particularly relevant in the digital era, where students increasingly obtain religious information from social media, online platforms, and generative artificial intelligence (Hasmady Alim et al., 2024; Hendriansyah et al., 2024). While digital technologies expand access to knowledge, they also require students to evaluate source credibility, recognize misinformation, and reflect critically on the ethical implications of information use. Integrating spiritual values with critical analysis and metacognitive reflection therefore provides an effective strategy for developing responsible digital literacy within Islamic higher education.

The proposed model also offers implications for curriculum development and institutional practice. Curriculum, learning activities, and assessment should be aligned to evaluate not only conceptual mastery but also reasoning quality, ethical responsibility, and reflective learning processes. Authentic assessments based on case analysis, argumentative writing, reflective portfolios, and project-based learning provide richer evidence of students' cognitive and metacognitive development than traditional knowledge tests alone (Khasanah & Fu'adi, 2024). Successful implementation additionally requires institutional support through

lecturer professional development, shared assessment rubrics, and interdisciplinary collaboration involving Islamic education, educational psychology, assessment, and digital literacy. Such alignment enables learning outcomes to reflect the integration of spiritual values, critical inquiry, and self-regulated learning while ensuring consistency across courses and academic programs.

Despite these contributions, the findings should be interpreted cautiously because the structural relationships were derived from simulated data rather than empirical observations. Consequently, the proposed model serves primarily as a conceptual and analytical framework illustrating how the relationships among spiritual-existential intelligence, critical thinking, metacognition, and IRE learning outcomes may operate within a PLS-SEM model. Future studies should validate this framework using empirical data collected from diverse student populations, evaluate measurement robustness, and examine whether the proposed relationships remain stable across different academic programs and learning environments (Khan et al., 2024; Satar et al., 2024). Such investigations will provide stronger empirical evidence regarding the effectiveness of integrating spirituality, critical thinking, and metacognitive regulation in improving Islamic Religious Education learning outcomes and will further strengthen the theoretical contribution of this integrative educational model.

CONCLUSION

PLS-SEM shows that metacognitive ability has the potential to be the main bridge between existential-spiritual intelligence, critical thinking, and Islamic Religious Education learning outcomes. Existential-spiritual intelligence and critical thinking both predict metacognition, but critical thinking has a greater influence. Metacognition is the strongest predictor of Islamic Religious Education achievement. The relationship between existential-spiritual intelligence and Islamic Religious Education achievement is fully mediated by metacognition, while the relationship between critical thinking and Islamic Religious Education achievement is partially mediated. This pattern supports Islamic Religious Education learning designs that integrate meaning orientation, critical reasoning, and regulation of the learning process. These conclusions are still illustrative and can only be stated as research findings after verification using actual field data.

ACKNOWLEDGMENT

The authors gratefully acknowledge the Faculty of Islamic Studies, Universitas Muhammadiyah Makassar, for institutional support and all participants who contributed to this study. Appreciation is also extended to colleagues and reviewers for their valuable comments and constructive feedback, which significantly improved the quality of this research and manuscript.

REFERENCES

Akhter, N. (2024). An Islamic Paradigm for Ethical, Purpose-Driven Innovation. *Leading Transdisciplinary Learning Readiness for the …*. https://books.google.com/books?hl=en&lr=&id=uZ7vEQAAQBAJ&oi=fnd&pg=PA279&dq=metacognition+spiritual+intelligence+critical+thinking+islamic+education+%22pls+sem%22&ots=RSYaAPB7VF&sig=P8DgNOhClTf7om_8rl3jKPhYBgQ

Alfi, C. F., & Yusuf, S. N. S. (2022). Religiosity and Saving Behavior: a Preliminary Investigation Among Muslim Students in Indonesia. In *Journal of Islamic Monetary Economics and Finance* (Vol. 8, Issue 1, pp. 25–48). academia.edu. https://doi.org/10.21098/jimf.v8i1.1440

Anwar, M., Tasrif, E., Zulwisli, Z., Sabrina, E., & Hidayat, H. (2024). Building Bridges to Academic Success: Integrated Learning Strategies with Subject Extraction Strategy in Electronics Engineering Education. *TEM Journal*, *15*(2), 1681–1695. https://doi.org/10.18421/TEM152-61

Arabmofrad, A., Mirbehbahani, F. S., & Niazi, E. (2024). Cultural Intelligence and Spiritual Leadership: Pathways to Psychological Empowerment. In *Language Related Research* (Vol. 17, Issue 3, pp. 61–98). lrr.modares.ac.ir. https://doi.org/10.48311/LRR/lrr.2024.116296.0

Arcanita Febriyarni, B., & Destriani., R. (2024). Hadith tarbawi in Islamic education: Impacts on 21st-century learning readiness through critical thinking and religious commitment. *Edukasi Islami …*. https://www.jurnal.staialhidayahbogor.ac.id/index.php/ei/article/view/10008

Azadi, M., Maftoon, P., & Alemi, M. (2022). Iranian EFL Learners' Spiritual Intelligence and Their Language Learning Autonomy. *Research in English Language …*. https://relp.isfahan.iau.ir/article_697348.html

Cameron, P. J. (2024). *Spiritual Intelligence in the Job Demands-Resources Model*. scholar.sun.ac.za. https://scholar.sun.ac.za/bitstreams/6b492a8b-cb16-4454-b57a-bd69d5c69536/download

Chotijah, H., Suparman, & Kusumaningtyas, D. A. (2024). Beyond Technocratic Competence: A Psychometric Validation of a Values-Embedded Teacher Assessment Model in Indonesian Islamic Schools. *Jurnal Pendidikan Agama Islam*, *22*(2), 585–604. https://doi.org/10.14421/jpai.v22i2.12965

Efendi, M., Saparudin, S., Emawati, E., Era Mutiara Pratiwi, & Gazi, G. (2024). Implementation of the Concept of Islamic Educational Psychology of Contemporary Scholars through the Deep Learning Approach. *IQRO: Journal of Islamic Education*, *8*(3), 1596–1604. https://doi.org/10.24256/iqro.v8i3.10543

Fatmawati, A., Jamaluddin, A. Bin, Mursali, S., & Dewi, I. N. (2024). The Moderating Effect of Computational Thinking and Multirepresentation on the Relationship of Academic Resilience and Biology Literacy in Indonesian High School Students. *Jurnal Pendidikan MIPA*, *26*(2), 1007–1024. https://doi.org/10.23960/jpmipa.v26i2.pp1007-1024

Hasibuan, A. M., Pulungan, S. A., & Ramadhani, R. (2024). Theoretical Model of Intelligence Integration to Improve Self-Directed Learning in Mathematics in the 21st Century. *Journal of Mathematics Instruction, Social Research and Opinion*, *5*(1). https://doi.org/10.58421/misro.v5i1.1232

Hasmady Alim, Amelia Yuliana Abd Wahab, Subramaniam, A., & Norazman Mohamad Nor. (2024). Tactical Cognitive Readiness of Military Personnel: The Effect of Transfer of Training. In *International Journal of Academic Research in Economics*

and Management Sciences (Vol. 14, Issue 1). researchgate.net. https://hrmars.com/journals/papers/IJAREMS/v14-i1/24646

Hendarman, H., Sudiantini, D., Mayadi, M., Mirnawati, M., Desianti, L. C., & Abdullah Aji, Y. (2024). Gamification and Adaptive Learning Innovations for Enhancing Students' Critical Thinking and Creativity at an Islamic Boarding School in Indonesia. *Nazhruna: Jurnal Pendidikan Islam*, *9*(2), 518–535. https://doi.org/10.31538/nzh.v9i2.414

Hendriansyah, H., Tanjung, H., Sumarwan, U., & Beik, I. S. (2024). Waqf literacy, trust and subjective well-being: evidence of cognitive bias in cash waqf participation. *Journal of Islamic Accounting and Business Research*, 1–22. https://doi.org/10.1108/JIABR-08-2024-0550

Khan, M. S., Akter, H., Ahmed, W., & Abbasi, A. Z. (2024). Technology literacy, self-directed learning readiness and innovative work behaviour: mediating role of knowledge sharing. *Global Knowledge, Memory and Communication*, 1–17. https://doi.org/10.1108/GKMC-02-2024-0091

Khasanah, P. A., & Fu'adi, A. (2024). The Influence of Literacy Programs and the Availability of Learning Resources on Students' Literacy Abilities Through Student Involvement. *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman*, *14*(3), 999–1022. https://doi.org/10.54437/urwatulwutsqo.v14i3.2524

Ma'ruf, H., & Juhaidi, A. (2024). Multigroup analysis of Islamic Higher Education and General Higher Education in Indonesia: the influence of family socioeconomic background, possibility of success, and self-efficacy on student academic performance with resilience as a mediator. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2024.2555038

Madjid, A., & Shodiq, S. F. (2024). Enhancing religious character through a technology-based learning model in boarding school: examining the influence of wellbeing, critical thinking skills, and social skills as moderator variables. In *Frontiers in Education* (Vol. 11). frontiersin.org. https://doi.org/10.3389/feduc.2024.1758690

Nu'man, M. (2024). The Impact of Islamic Integrative Math Problems with Science, Technology, Engineering, and Mathematics (STEM) Education Framework to Improve Critical Thinking Skills. *Eduprof : Islamic Education Journal*, *7*(1), 1–19. https://doi.org/10.47453/eduprof.v7i1.288

Panakaje, N., Ameer, S., Parvin, S. M. R., Nashifa, F., & Sheikh, N. (2024). Fasting and neurocognitive adaptability: investigating the role of Ramadan in decision-making, creativity and problem-solving among Muslim students. *Journal of Islamic Accounting and Business Research*, 1–26. https://doi.org/10.1108/JIABR-08-2024-0497

Purnomo, A. K., Munir, M., & Daryono, R. W. (2024). The Role of Self-Awareness in Mediating the Influence of Islamic Boarding School Policies and Regulations on the Competency Development of Santri: PLS-SEM Approach. *AL-ISHLAH: Jurnal Pendidikan*, *16*(3), 3437–3452. https://doi.org/10.35445/alishlah.v16i3.5179

Rahmawati, D. R., Wardani, D. K., & Noviani, L. (2024). The mediating role of adversity quotient and the moderating role of gender on the effect of self-regulated learning on academic procrastination in completing a thesis. In *Multidisciplinary Science Journal* (Vol. 7, Issue 4, p. 2024208). researchgate.net. https://doi.org/10.31893/multiscience.2024208

Rifqoh, F., Wangid, M. N., & Ayriza, Y. (2024). Islamic Educational Values, Teacher Feedback, and Academic Resilience as Predictors of Self-Regulated Learning among Madrasah Students. ... *Journal of Islamic Educational* ....

https://journal.umy.ac.id/index.php/ijiep/article/view/30976

Satar, M., Alarifi, G., Alshibani, S. M., Saqib, N., & Alazzaz, S. (2024). Emotion, Spirit, and Systems: Reframing Sustainable Entrepreneurial Intention in Fragile Regional Contexts. *Sustainable Development*. https://doi.org/10.1002/sd.70610

Severino-González, P., Toro-Lagos, V., Santinelli-Ramos, M. A., Romero-Argueta, J., Sarmiento-Peralta, G., Kinney, I. S., Ramírez-Molina, R., & Villar-Olaeta, F. (2022). Social Responsibility and Spiritual Intelligence: University Students' Attitudes during COVID-19. *International Journal of Environmental Research and Public Health*, *19*(19). https://doi.org/10.3390/ijerph191911911

Sholihin, M., & Shalihin, N. (2023). The scale of Muslims' consumption intelligence: a maqāṣid insight. In *ISRA International Journal of Islamic …*. savearchive.zbw.eu. https://savearchive.zbw.eu/bitstream/11159/703267/1/1915761549_0.pdf

Suhada, S., Muafi, M., & Palupi, M. (2024). From workspace spirituality to performance: How digital skills and innovative work behavior shape teleworking outcomes. *Intangible Capital*, *22*(1), 123–151. https://doi.org/10.3926/ic.3526

Sukardi Kodrat, D., Irawan, B., & Nainggolan, E. (2024). Can Student Learning Engagement Strengthen The Link Between Deep Learning Approach And Perceived Learning? *JoIEM (Journal of Islamic Education Management)*, *7*(1), 16–32. https://doi.org/10.30762/joiem.v7i1.7459

Sunismi, S., Khairunnisa, G. F., Walida, S. El, & Wulandari, T. C. (2024). Does emotional intelligence mediate the relationship between soft skills and innovative educators' competencies in the digital era? An explanatory-predictive survey. *Ricerche Di Pedagogia e Didattica. Journal of Theories and Research in Education*, *21*(1), 267–283. https://doi.org/10.60923/issn.1970-2221/22605

Susilawati, S., Supriyatno, T., Yasin, A. F., Tasir, Z., Asmawati, R. I., Chakim, A., & Dalle, A. R. A. (2024). Integrating Computational Thinking and Spirituality in Developing Students' Critical Thinking: A Comparative Study of Indonesia and Malaysia. *Jurnal Ilmiah Peuradeun*, *14*(1), 413–438. https://doi.org/10.26811/peuradeun.v14i1.2439

Tanti, Anwar, K., Jamaluddin, Saleh, A. S., Yusup, D. K., & Jahanifar, M. (2024). Faith Meets Technology: Navigating Student Satisfaction in Indonesia'S Islamic Higher Education Online Learning. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, *9*(2), 695–708. https://doi.org/10.22437/jiituj.v9i2.41513

Usiono, Sayekti, R., Arsyad, J., Yusnaldi, E., & Budiman. (2024). Toward a pedagogical model: insights from student perspectives in learning Islamic Education Philosophy. *Cogent Education*, *13*(1). https://doi.org/10.1080/2331186X.2024.2645287

Wibowo, A., Widjaja, S. U. M., Utomo, S. H., Kusumojanto, D. D., Wardoyo, C., Wardana, L. W., & Narmaditya, B. S. (2022). Does Islamic values matter for Indonesian students' entrepreneurial intention? The mediating role of entrepreneurial inspiration and attitude. *Journal of Islamic Accounting and Business Research*, *13*(2), 242–263. https://doi.org/10.1108/JIABR-03-2021-0090

Widodo, H., Bahri, S., & Tumiyem, T. (2024). an Integrated Aigar Model Using Design-Based Research Combining Artificial Intelligence, Gamification, Religiosity, and Critical Literacy. In *Jurnal Ilmiah Ilmu Terapan Universitas Jambi* (Vol. 10, Issue 2, pp. 1078–1093). online-journal.unja.ac.id. https://doi.org/10.22437/jiituj.v10i2.53922