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An Epistemic Coexsitance-Based Integrative Pedagogical Model of Islam and Science in Higher Education

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Abstract

The relationship between Islam and science remains a strategic focus in Islamic higher education institutions. This study examines the implementation of Nidal Guessoum's epistemic-ethical coexistence model in enhancing the religious-scientific literacy of students at Muhammadiyah University of Makassar. Using a qualitative-exploratory design, data were collected through interviews, classroom observations, and document analysis, then analyzed thematically. The majority of respondents recognized the importance of integration, although their understanding of it varied. When Islamic values were directly linked with scientific concepts, student participation and critical reflection increased, especially on environmental and technological issues. Furthermore, 74% of students indicated that this approach helped unify rationality and faith. However, the main challenges stemmed from limited interdisciplinary competence among lecturers and inconsistent institutional policy support. Nevertheless, the findings indicate significant opportunities to strengthen religious-scientific literacy through integrative curriculum policies and targeted faculty training. This study affirms that integrating science and religion is not only feasible but also effective in fostering a holistic conceptual and spiritual understanding. The study also recommends longitudinal research to evaluate the long-term impact on students' scientific and ethical competencies as well as on society at large.

Keywords: *Islam-Science Integration; Religious- Scientific Literacy; Epistemic Coexistence; Islamic Higher Education.*

Abstrak

Relasi Islam-sains masih menjadi agenda strategis di perguruan tinggi Islam. Studi ini menelaah penerapan model koeksistensi epistemik-etis Nidal Guessoum dalam meningkatkan literasi saintifik religius mahasiswa Universitas Muhammadiyah Makassar. Melalui desain kualitatif-eksploratif, data dikumpulkan via wawancara, observasi kelas, dan telaah dokumen, lalu dianalisis tematik. Mayoritas responden menyadari pentingnya integrasi, namun pemahaman mereka beragam. Ketika nilai-nilai Islam dihubungkan langsung dengan konsep ilmiah, partisipasi dan refleksi kritis meningkat, terutama pada isu lingkungan dan teknologi; 74 % mahasiswa menyatakan pendekatan ini membantu menyatukan rasionalitas dan keimanan. Tantangan utama berasal dari keterbatasan kompetensi interdisipliner dosen dan inkonsistensi dukungan kebijakan institusi. Meski demikian, temuan menunjukkan peluang besar bagi

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penguatan literasi saintifik religius melalui kebijakan kurikulum integratif dan pelatihan dosen terarah. Studi ini menegaskan bahwa integrasi sains-agama tidak hanya layak, tetapi juga efektif membentuk pemahaman konseptual sekaligus spiritual yang utuh. Studi ini juga merekomendasikan riset longitudinal untuk menilai dampak jangka panjang pada kompetensi ilmiah-etika mahasiswa dan masyarakat.

Kata kunci : Integrasi Islami-Sains; Literasi Saintifik-Religius; Koeksitensi Epistemik; Pendidikan Tinggi Islam.

I. Introduction

The debate regarding the relationship between science and religion has been a central issue in the intellectual history of humanity and continues to evolve into the contemporary period. In the context of the Islamic world, the epistemological tension between these two domains is exacerbated by the impact of colonialism, the dominance of the positivistic paradigm in modern science, and the challenges of adapting to technological advancements. Historically, the dualism between science and religion in the Islamic world began in the 13th century, later reinforced by the influence of positivism and materialism during the late Ottoman Caliphate period (Biçer, 2023; Sarwi et al., 2024). The view that separates knowledge and faith became increasingly entrenched in the educational system, giving rise to a secular epistemological framework that is difficult to reconcile with Islamic values (Alsuhaymi, 2025).

A number of contemporary Muslim scholars have sought to bridge this gap. Seyyed Hossein Nasr, for instance, has offered a critique of modern science—which he regards as reductionist—and has called for the importance of a spiritual foundation in the epistemology of science (Hidayatullah et al., 2023). Ziauddin Sardar emphasizes the need for a holistic approach to knowledge that unites scientific reasoning with ethical and spiritual dimensions (Gunagraha & Muttaqin, 2025; Mahmudi et al., 2022). A similar appeal is voiced by Syed Muhammad Naquib al-Attas through the idea of the Islamization of knowledge, which aims to integrate empirical, rational, and esoteric perspectives within a tawhidic framework (Mahmudin et al., 2021). Such integrative literacy is considered crucial for enhancing critical thinking skills and providing a holistic educational experience for Muslim students (Ningsih et al., 2022; Yafiz & Daulay, 2023).

Despite many conceptual efforts, the integration of science and Islam in higher education still faces serious challenges. The main issue is the weak epistemic understanding among students regarding the position of science and religion as entities that can constructively coexist. Many students continue to view the two as dichotomous opposites, or adopt an absolutist stance toward one of them. This crisis reflects the inability of the educational system to cultivate a religious scientific literacy that emphasizes the importance of spiritual ethics in scientific understanding (Hidayatulloh, 2024).

The various solutions offered thus far tend to be normative and macro in nature. The concept of Islamization of science and tawhid-based integrative curricula have emerged as dominant themes in academic discourse. However, these approaches often fail to reach the practical realm of classroom learning. The gap between conceptual vision and pedagogical reality has become a major obstacle to strengthening religious scientific literacy. Many Islamic educational institutions do not yet have a learning model that effectively bridges the religious and scientific dimensions in students' learning experiences (Puspitasari & Yuliana, 2022; Marlini et al., 2024).

In this context, the "epistemic and ethical coexistence" approach developed by Nidal Guessoum emerges as a significant alternative. This approach emphasizes that science and Islam can coexist side by side without any need for forced unification. Epistemologically, it recognizes the autonomy of the scientific method grounded in rationality and observation, while remaining open to revelation as a source of knowledge. Ethically, it stresses that scientific practice must be guided by Islamic moral values such as responsibility, justice, and the common good. Thus, this approach fosters critical dialogue between science and religion free from reductionism, and shapes a model of learning that is scientific, ethical, and spiritual.

Unlike conventional Islamization approaches, Guessoum does not call for one domain to be subordinated to the other; rather, he underscores the importance of a dialogical relationship between modern science and Islamic thought (Ahmed, 2021; Kadirov et al., 2020). This approach provides room to respect the autonomy of each epistemological system, while positioning ethics as a central element in the development of knowledge.

Guessoum rejects reductionism in the integration of science and Islam, and instead proposes a form of coexistence that prioritizes rational openness, awareness of values, and critical reflection in scientific practice (Malik et al., 2021). This perspective reflects an important evolution in the discourse on the integration of science and religion, as it is not merely oriented toward conceptual compatibility, but rather builds a collaborative framework that can be applied in science education that is contextual, ethical, and spiritual.

Several studies have explored Nidal Guessoum's contribution to developing integrative thinking in Islamic higher education. Scholars such as Zainal Abidin Bagir and Nidhal Abdelkader consider Guessoum's approach highly relevant in confronting epistemic extremism and essential in shaping Muslim scientists to become reflective, critical, and ethical. However, only a few studies have systematically examined how this approach can be adapted within pedagogical settings.

Recent pedagogical research highlights the need to transform learning approaches by integrating Islamic values with modern scientific methodologies. Wahyudi and Alatas emphasize reconstructing the epistemology of Islamic education to make it more critical

and reflective, while Hidayatullah proposes a STEM learning strategy rooted in tawhidic values to cultivate religious scientific awareness. Nevertheless, a methodological gap remains in operationalizing epistemic and ethical principles into concrete, applicable, and participatory learning practices.

To address this gap, the present study explores the relevance and pedagogical adaptation of Nidal Guessoum's epistemic and ethical coexistence model within Islamic higher education, focusing on Universitas Muhammadiyah Makassar. The research seeks to understand three main aspects: first, how Guessoum's epistemic-ethical coexistence model is implemented in the learning context of Islamic higher education; second, how lecturers and students respond epistemologically to this integrative model; and third, what factors support or hinder its implementation. Accordingly, this study aims to analyze the application of Guessoum's epistemic-ethical coexistence approach, identify the perceptions, attitudes, and epistemic readiness of both lecturers and students toward integrating Islam and science in the learning process, and explore challenges and strategic opportunities for developing integrative curricula in Islamic higher education.

II. Research Method

This study adopts a qualitative approach with an exploratory design to investigate in depth the integration of Islam and science in Islamic higher education. This design allows researchers to capture the complexity of Muslim students' meaning construction and their epistemological beliefs related to learning practices that are difficult to quantify (Latuconsina, 2023). The exploratory approach is also effective in identifying institutional cultural factors influencing integration efforts, including structural and ideological obstacles within Islamic campuses (Hanafi et al., 2023; Farhan et al., 2021).

The study was conducted at Universitas Muhammadiyah Makassar, an institution that explicitly develops an integrative curriculum of science and Islamic values oriented toward Progressive Islam. This environment serves as a strategic laboratory to examine the relevance of Nidal Guessoum's model of ethical epistemic coexistence and the pedagogical responses of both lecturers and students (Yafiz & Daulay, 2023).

Data were collected through three main techniques for triangulation: in-depth interviews, participatory observation, and document analysis. Semi-structured interviews involved a total of 6 lecturers (2 from the Faculty of Agriculture and 4 from the Faculty of Medicine and Health Sciences), 25 students from both faculties, and 4 institutional documents, namely the Al-Islam Kemuhammadiyahan (AIK) Curriculum Development Guidelines of PTMA by Majelis Diktilitbang PP Muhammadiyah, the AIK Curriculum of Universitas Muhammadiyah Makassar, and the AIK IV Lesson Plans (RPS) from both the Faculty of Agriculture and the Faculty of Medicine and Health Sciences. The inclusion criteria for participants included lecturers who had taught AIK IV courses for at

least two semesters and students who had completed the AIK IV course. The research was conducted over two months, from March to April 2025.

Observations were carried out in several integrative lecture sessions to record teaching strategies, student interactions, and cognitive-affective responses, supplemented by field notes and visual documentation to enhance the study's credibility. Document analysis included syllabi, lesson plans (RPS), and institutional policies to map the extent to which integrative values were reflected at the design and implementation levels.

Data were analyzed using a thematic approach due to its flexibility in identifying meaning patterns within qualitative data (Hanafi et al., 2023; Farhan et al., 2021). The process involved five iterative stages: comprehensive reading, coding of meaning units, grouping of initial themes, reviewing final themes, and constructing the final narrative. Coding was independently conducted by two researchers, followed by inter-coder agreement testing to minimize interpretive bias (Christian et al., 2023). The validity of findings was reinforced through source and method triangulation by comparing results from interviews, classroom observations, and policy documents to ensure consistency of evidence (Adiyono et al., 2024). Member checking with key informants was used to confirm interpretive accuracy, while researcher reflexivity was maintained through continuous self-evaluation to minimize subjective influence.

Ethical considerations were carefully maintained throughout all stages of the research. Participants received detailed explanations about the purpose, benefits, and potential risks of the study. Written informed consent was obtained, identities were anonymized, and all data were securely stored. Given the sensitivity of religious themes, all research activities were conducted with a respectful and nonjudgmental attitude.

Theoretically, this study positions Guessoum's model of ethical epistemic coexistence as the primary analytical lens. Analytical indicators include openness to scientific methodology, recognition of domain autonomy, rejection of reductionist dichotomies, and the internalization of ethical values in scientific practice. This analytical framework guided the evaluation of participants' perceptions, responses, and pedagogical practices in interpreting the integration of Islam and science.

III. Result and Discussion

Based on the thematic analysis derived from the coding process of interview data, classroom observations, and document reviews, several patterns of meaning were identified and further developed into the main themes of the study. The coding process served to trace the interconnections between concepts emerging from the field and the analytical framework of Nidal Guessoum's epistemic–ethical coexistence model. Accordingly, the themes presented in this section are the result of a systematic synthesis

of qualitative data that have been reduced, categorized, and interpreted to holistically depict the dynamics of Islam–science integration within Muhammadiyah University of Makassar.

The findings of this study reveal complex dynamics in the process of integrating Islam and science within an Islamic higher education setting. This study focuses on how the approach of epistemic and ethical co-existence as proposed by Nidal Guessoum is being received and practiced by students, lecturers, and the institution at Universitas Muhammadiyah Makassar. The exploratory process involving interviews, classroom observations, and document analysis provides an in-depth picture of perceptions, pedagogical practices, as well as challenges and opportunities in developing religious scientific literacy. In general, there are positive indications among educational stakeholders regarding the importance of integrating Islamic values into science instruction, although the level of understanding and readiness for implementation still varies.

Thematic analysis shows that the relationship between science and Islam is not purely a conceptual issue, but is strongly influenced by the structure of instruction, the epistemic capacity of lecturers, and the institutional policy framework. Some students have shown progress in appreciating an integrative approach that does not separate faith and scientific rationality, particularly when engaged in reflective and contextual discussions. However, the success of this integration largely depends on the quality of instructional design and the lecturers' ability to substantively convey the interconnections between scientific concepts and spiritual values. This section presents the research results in detail through five interrelated thematic sub-sections: student perceptions, learning dynamics, relevance of Guessoum's approach, implementation challenges, and the potential for strengthening religious scientific literacy.

A. Epistemic Coexistence in Students Perceptions

Findings regarding students' perceptions of epistemic co-existence are presented in Table 1 below:

Table 1. Students' Perceptions of Epistemic Coexistence between Islam and Science

Aspect	Student Perceptions
Initial Awareness	Recognizing the importance of the relationship between Islam and science, but not yet having an integrated and comprehensive understanding.
Epistemological Dichotomy	Science is viewed as autonomous and rational, while Islam is seen as a normative and spiritual belief system; the two are conceptually separated.
Integrative Reflection	Some students have begun to accept that science and Islamic values can go hand in hand and reinforce one another.
Interdisciplinary Experience	In courses on environment, health, and technology, students actively connect scientific theories with Islamic values.

These findings indicate that students at Universitas Muhammadiyah Makassar have an initial awareness of the importance of the relationship between Islam and science, yet their perceptions of the epistemic co-existence of the two are still highly varied. In interviews, some students stated that they consider science to be an autonomous and rational enterprise, whereas they view Islam as a normative, spiritual belief system. One student explained, "Science teaches us how the world works, but Islam teaches us why it matters. Both can coexist when we look for the meaning behind facts." This separation reflects an epistemological dichotomy that has not been fully bridged. This finding is consistent with research by Sarwi et al. (2024) and Lathif and Susilaningsih (2023), which revealed that many Muslim students still experience tension, perceiving religion and science as two domains of knowledge that contradict each other.

However, a number of students are beginning to demonstrate a more reflective understanding of the potential integration of Islamic values within scientific approaches. They suggested that objective scientific methodology does not have to conflict with the ethical and spiritual principles of Islam. A participant stated, "I used to think science was only about logic and data, but now I see that values and ethics guide how we use knowledge." This perspective suggests early signs of the "epistemic and ethical co-existence" concept proposed by Nidal Guessoum, an awareness that science can proceed in tandem with faith-based values without negating one another. Previous studies support this finding as well; integrating ethical values into science instruction has been shown to enhance the relevance and meaningfulness of learning for students (Mohammed et al., 2021; Ningsih et al., 2022).

Classroom observations showed that using an interdisciplinary approach to link scientific concepts with principles from the Qur'an and hadith increased student engagement in discussions and reflective dialogue. In courses that addressed issues such as the environment, health, and technology, students were actively involved in analyzing scientific theories and relating them to Islamic values. This supports the finding of Stones et al. (2020) that interdisciplinary discussions increase student participation and encourage critical thinking about the relationship between science and religion.

B. Dynamics of Integrative Learning in The Classroom

Findings related to the dynamics of integrative learning in the classroom are presented in Table 2 below:

Table 2. Dynamics of Integrative Learning in the Classroom

Aspect	Dynamics in Implementation
Interdisciplinary Competence of Lecturers	Lecturers with educational backgrounds in both Islamic and general fields can contextualize scientific material with Islamic principles (e.g., relating thermodynamics to the concept of *qadar* (divine decree) and the order of God's creation).

Impact of Integrative Approach	Enhances students' conceptual understanding and enriches their spiritual experience in learning.
Implementation Challenges	Some lecturers struggle to explicitly integrate science and Islam due to a lack of training, teaching materials, and institutional support.
Symbolic Approach	Many lecturers simply add Qur'anic verses or hadith quotations without establishing strong epistemological connections, rendering this approach ineffective.
Observational Implications	Symbolic instruction does not stimulate deep reflection; an epistemic and contextual approach is needed to build substantial connections between values and scientific methods.

In implementing integrative learning, there is noticeable variation in lecturers' approaches and epistemic readiness. Lecturers with interdisciplinary educational backgrounds in both general sciences and Islamic studies appear better able to contextualize science material with Islamic principles. For example, one lecturer linked principles of thermodynamics with the concept of qadar and the order of God's creation. Such an approach not only enhances students' conceptual understanding but also enriches the spiritual dimension of learning. One lecturer explained, "When I relate a physics principle to the idea of divine order, students become more engaged because they see the harmony between knowledge and faith." This finding is in line with studies by Purwati et al. (2023) and Kurniasih et al. (2021), which demonstrate that integrating Islamic values into STEM education yields a more meaningful and contextual learning experience.

However, challenges emerge as some lecturers acknowledge difficulty in designing courses that explicitly connect science and Islam. The lack of training, teaching materials, and institutional support are the main obstacles to implementing a deeper integrative approach. A lecturer admitted, "Sometimes we only have limited resources, so integration ends up being symbolic—just quoting verses without deeper explanation." Some instructors simply add Qur'anic or hadith quotations without developing a strong epistemological connection to the scientific concepts. Such a symbolic approach is considered ineffective and may even reinforce the dichotomy between religion and science (Mansir, 2020; 2021).

Field observations support this conclusion; symbolic teaching methods tend not to trigger deep reflection or understanding among students. This indicates the necessity of an integrative approach that is both epistemic and contextual. As emphasized by Farhan et al. (2021), only by building substantive connections between values and scientific methodology can instruction create a holistic and reflective learning experience.

C. The Relevance of Guessoum's Idea in The Local Context

When Nidhal Guessoum's ideas were introduced in class discussions and interviews, student responses showed great enthusiasm. Concepts such as "open but critical rationality" and "value-guided science" were deemed highly relevant in defining the scientific stance of Muslim students in the contemporary era. Students felt that they do not need to choose between faith and reason; rather, they can integrate both into a mutually supportive praxis. This view aligns with the conclusion of Mohammed et al. (2021) that integrating science and religion allows students to build a coherent understanding of the world and their social responsibilities.

Interviews with lecturers indicated that Guessoum's approach has strong theoretical appeal, but still faces challenges in its translation into practical instructional design. One lecturer commented, "The concept is very relevant, but we need proper materials and structured guidance to apply it effectively in the classroom." The lecturers suggested the need for support in the form of modules, teaching materials, and systematic training to help educators implement these ideas effectively in teaching practice. This finding is consistent with Fianto et al. (2023), which emphasized the importance of lecturers' epistemic capacity in constructing meaningful interdisciplinary learning.

D. Implementation Challenges

The following table presents the findings regarding the challenges of implementing this model in educational practice:

Tabel 3. Implementation Challenges

Aspect	Challenge
Curriculum and Policy	The curriculum has been directed toward integrating Islam and science, but it is not yet supported by consistent teaching and assessment policies.
Academic Guidelines	Some study programs lack explicit guidelines for developing religious scientific literacy.
Learning Evaluation	Evaluation still focuses on technical aspects and does not yet consider ethical or spiritual dimensions.
Faculty Resources	Limited availability of faculty with interdisciplinary expertise hinders integrative learning.
Forums and Training	No dedicated training programs or forums are currently available for developing value-based instructional design.
Fragmented Student Learning	Students tend to separate science from religious values and are not yet accustomed to reflecting on the ethical and spiritual aspects of scientific practice.

This study also revealed a number of institutional and cultural challenges hindering the implementation of the integrative approach. The curriculum at Unismuh Makassar has indeed been oriented towards integrating Islamic values and science, but it has not been fully supported by consistent teaching and assessment policies. Several study programs still lack explicit guidelines for promoting integrative learning. Learning

evaluation tends to measure only mastery of technical material, without considering ethical or spiritual aspects. A lecturer noted, "We already have a vision for integration, but there is still a gap in how it's applied, policies and evaluations often remain conventional."

At the institutional level, the shortage of faculty with interdisciplinary expertise is a main obstacle. In addition, no specific training programs or academic forums have been established to discuss value-based integrative instructional design. These findings support the statements of Amaliyah (2024) and Hasanah & SZ (2023) that structural weaknesses and policy limitations often impede epistemic integration initiatives in Islamic higher education.

Among students, the primary obstacle lies in fragmented learning habits. They tend to separate the learning of science from religious values, and are not yet accustomed to reflecting on the ethical or spiritual dimensions of scientific practice. This situation highlights the importance of cultivating holistic learning habits from an early stage, as noted by Farhan et al. (2021).

E. Potential for Strengthening the Epistemic and Ethnical Coexitence Model

Despite these obstacles, the study found great potential to strengthen the implementation of the epistemic and ethical coexistence model. Both lecturers and students demonstrated openness to a learning approach that situates science within the framework of Islamic values and ethics. Institutions like Unismuh Makassar have a vision of Progressive Islam that can serve as a foundation for strengthening curriculum policies and instructional practices that integrate scientific knowledge with ethical and spiritual dimensions. A student reflected, "When science is taught with moral meaning, it makes learning feel more human and connected to my faith."

Experiences in several courses show that when lecturers are able to design integrative and reflective learning narratives, students not only gain a deeper understanding of scientific material but also demonstrate higher ethical awareness and personal responsibility. One lecturer remarked, "Integrative teaching encourages students to think critically while remaining grounded in values, it bridges logic and conscience in one process." Guessoum's approach, emphasizing open rationality and ethical awareness, has proven effective in cultivating both intellectual and moral depth in students.

This study concludes that the idea of epistemic and ethical coexistence offered by Guessoum holds great potential for adaptation in the context of Islamic higher education in Indonesia. However, the success of its implementation depends heavily on institutional commitment, pedagogical readiness, and a supportive curriculum design. Systematic efforts in faculty capacity development, curriculum training, and the cultivation of a reflective academic culture are essential to firmly ground this approach in a sustainable

way. Thus, the epistemic and ethical coexistence model can develop as a key foundation for transformative, value-oriented higher education.

The findings of this study indicate that students' perceptions of the relationship between Islam and science still span a diverse spectrum, from dualistic understandings to more reflective forms of epistemic coexistence. This diversity suggests that efforts toward epistemic integration in Islamic higher education require a contextual and continuous pedagogical approach. As emphasized by Fauzi and Hamami (2022), the epistemological tension between empirical reasoning and theological faith is a latent issue in the epistemology of Muslim students. When teaching does not provide room for a balanced articulation of both, cognitive dissonance emerges that hinders the development of a holistic epistemic understanding.

The use of an interdisciplinary approach in learning, as implemented in several classes at Unismuh Makassar, has been proven to increase student participation and reflection. This affirms the findings of Stones et al. (2020), which show that interdisciplinary dialogue between science and religion can shift student perceptions from dichotomy toward a synthesis of understanding. However, the effectiveness of this approach heavily depends on the epistemic readiness of the lecturers, both in mastery of scientific material and in the ability to relate it contextually to Islamic values. As shown by Fianto et al. (2023), lecturers' epistemic competence is a key factor in the success of curriculum integration involving both scientific and religious aspects.

Findings regarding the dominance of a symbolic approach in knowledge integration also indicate a reduction of meaning in the teaching of religion and science. When Qur'anic verses or hadith are positioned only as rhetorical complements in science learning, students do not gain a substantive understanding of the relationship between the two. This aligns with the critique of Mansir (2020; 2021), who states that the symbolic approach tends to maintain the epistemic dichotomy and fails to develop critical reflection on the relationship between religion and science. Therefore, instruction needs to be designed to integrate value aspects in depth, not just as narrative cosmetics.

The relevance of Nidal Guessoum's approach in the context of Indonesian Islamic higher education appears strong in navigating the tension between scientism and fundamentalism. Students who are introduced to the concept of "value-guided science" demonstrate a more integrative understanding and feel no need to sacrifice their faith to become rational scientists. This reinforces the idea of Mohammed et al. (2021), which emphasizes the importance of science education rooted in moral and spiritual values as the foundation for developing a progressive Islamic civilization. In this regard, Guessoum provides an operational framework for developing a curriculum that is not only scientific but also ethical and religious.

However, the main challenge in implementing Guessoum's approach lies at the institutional level. Lecturers who understand this approach recognize the need for teaching materials, modules, and specialized training to realize it in classroom practice. As revealed by Amaliyah (2024) and Hasanah & SZ (2023), limitations in institutional policies and a lack of interdisciplinary training have become significant obstacles in strengthening religious scientific literacy. Therefore, transforming Islamic higher education policy must include bolstering support structures, including faculty training and the development of learning materials based on value integration.

The separation between religious values and scientific approaches found in students' study habits indicates that the formation of an epistemic habitus needs to begin early in the educational process. Fragmented study habits will only reinforce epistemic dichotomy and diminish the relevance of learning. As emphasized by Ningsih et al. (2022), integrating scientific literacy and Islamic values will be more successful if carried out in a reflective and contextual learning environment, where students are invited to reflect on their social and spiritual responsibilities through scientific activities.

The role of curriculum design is crucial in guiding the success of epistemic integration. A curriculum that explicitly links religious and scientific competencies can provide a conceptual foundation for developing ethical and reflective learning methods. Purwati et al. (2023) stress the importance of mapping basic religious and scientific competencies in curriculum planning to produce holistic learning strategies. In this regard, Unismuh Makassar has great potential because it already possesses a vision of progressive Islam that can serve as a starting point for formulating integrative curriculum policies.

Furthermore, project-based learning that connects current issues with Islamic values can be a strategic model for strengthening religious scientific literacy. As shown by Nisa et al. (2022), integrating environmental issues into science learning framed by Islamic ethics encourages students to think both critically and spiritually. This model not only enhances scientific understanding but also builds ecological awareness and social responsibility as part of their religious mission.

The transformation of Islamic higher education institutions is also an important factor in developing a model of a Muslim scientist with strong character. Muqowim and Lessy (2021) assert that institutions must encourage collaboration between religious and science faculties to create productive cross-disciplinary discussion spaces. Such collaboration can yield profound curricular and pedagogical innovations and enrich knowledge production at the intersection of science and Islam.

Implementing routine professional training for lecturers is a strategic step to ensure the continuity of epistemic integration at the practical level. Lavonen (2021) suggests that developing pedagogical capacity through interdisciplinary training can strengthen lecturers' ability to manage learning that is complex and value-laden. In addition,

integrating educational technology that aligns with Islamic values can create a more interactive and meaningful learning space.

Institutional leadership and pro-innovation educational policies also greatly determine the success of epistemic reform. Hapidin et al. (2022) emphasize the importance of strengthening management and leadership in the context of Islamic education so that it can meet contemporary challenges and adapt to the demands of the Industrial Revolution 4.0. Curriculum reform must be accompanied by reform of academic culture that encourages exploration, collaboration, and critical reflection on scientific and spiritual values.

The long-term implications of Guessoum's approach have the potential to give rise to a new paradigm in the production of Islamic knowledge. When students are trained to see science and religion as domains that enrich each other, they become not only scientists who are academically competent, but also individuals who possess moral and spiritual integrity. Islamic higher education can play an important role in shaping a generation of Muslims ready to contribute to global civilization while remaining rooted in divine values. Therefore, an integrated reform strategy encompassing policy, curriculum, pedagogy, and academic culture is imperative to realize the grand vision of an Islamic education that is civilized and transformative.

IV. Conclusion

This study confirms that the integration of Islam and science through the epistemic and ethical coexistence model has strong potential to enhance students' conceptual understanding, ethical awareness, and epistemic maturity in Islamic higher education. The findings reveal that students who were introduced to this value-based integrative model demonstrated greater critical engagement and moral reflection, while lecturers showed openness to linking scientific reasoning with spiritual values. Although a few participants still exhibited a dichotomous perspective between religion and science, the overall response reflects a readiness to move toward a more holistic paradigm that harmonizes faith and rational inquiry.

In accordance with the objectives of this study, to analyze the application of Guessoum's epistemic-ethical coexistence approach, identify the perceptions, attitudes, and epistemic readiness of both lecturers and students toward integrating Islam and science in the learning process, and explore challenges and strategic opportunities for developing integrative curricula in Islamic higher education, this research demonstrates that the model can be effectively implemented to bridge scientific reasoning and moral responsibility within a unified learning framework.

The results highlight the essential role of lecturers' epistemic readiness, institutional policy support, and integrative curriculum design in fostering a balanced academic

environment that encourages both intellectual rigor and ethical reflection. Theoretically, this study offers an empirical and conceptual foundation for developing pedagogical designs that integrate values into Islamic higher education. Practically, it provides insights for future initiatives in faculty development, curriculum improvement, and institutional strengthening. Furthermore, this study opens opportunities for longitudinal research to examine the long-term impact of the epistemic-ethical coexistence model on students' epistemic competence, professional ethics, and scientific integrity. These findings reaffirm the study's purpose by showing that Guessoum's epistemic and ethical coexistence model serves as a transformative framework for harmonizing science and religion in contemporary Islamic education.

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