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## SCIENTIFIC CONSCIOUSNESS AMONG QUR'ANIC STUDIES AND EXEGESIS STUDENTS: A QUALITATIVE CASE STUDY AT UIN SUMATERA UTARA

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### Abstrak

Integrasi Al-Qur'an dan sains telah menjadi paradigma penting dalam pendidikan tinggi Islam di Indonesia, namun sebagian besar penelitian masih berfokus pada model kelembagaan dan kerangka epistemologis, sementara pengalaman mahasiswa dalam menginternalisasi integrasi tersebut belum banyak dikaji. Penelitian ini bertujuan mengeksplorasi bagaimana *scientific consciousness* berkembang pada mahasiswa Program Studi Ilmu Al-Qur'an dan Tafsir Universitas Islam Negeri Sumatera Utara dalam konteks paradigma *Wahdah al-Ulum*. Penelitian menggunakan pendekatan kualitatif dengan desain studi kasus. Data dikumpulkan melalui wawancara semi-terstruktur terhadap 62 mahasiswa dan dua dosen, observasi nonpartisipan terhadap praktik akademik mahasiswa setelah menyelesaikan mata kuliah *Scientific Thematic Exegesis*, serta analisis dokumen. Data dianalisis menggunakan *reflexive thematic analysis* dan divalidasi melalui triangulasi sumber, metode, dan dokumen. Hasil penelitian menunjukkan bahwa *scientific consciousness* merupakan konstruksi multidimensional yang berkembang melalui tiga dimensi yang saling berkaitan, yaitu *academic consciousness*, *practical consciousness*, dan *ethical consciousness*. Mahasiswa umumnya telah memiliki apresiasi konseptual terhadap hubungan Al-Qur'an dan sains, namun pemahaman metodologis, praktik penyelidikan ilmiah, dan internalisasi etika penelitian masih berkembang secara tidak merata. Berdasarkan temuan tersebut, penelitian ini mengusulkan kerangka konseptual *scientific consciousness* yang menjelaskan integrasi antara pemahaman epistemik, praktik ilmiah, dan tanggung jawab etis dalam pendidikan tinggi Islam.

**Kata Kunci:** *Scientific Consciousness*; Integrasi Al-Qur'an dan Sains; *Wahdah al-Ulum*; Pendidikan Tinggi Islam; Ilmu Al-Qur'an dan Tafsir; Studi Kasus Kualitatif.

### Abstract

The integration of the Qur'an and science has become a defining paradigm in Indonesian Islamic higher education; however, existing studies have focused primarily on institutional models and epistemological frameworks, while students' lived experiences of internalizing this integration

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remain underexplored. This study investigates how scientific consciousness develops among students of the Department of Qur'anic Studies and Exegesis at Universitas Islam Negeri Sumatera Utara within the context of the *Wahdah al-Ulum* paradigm. A qualitative case study design was employed. Data were collected through semi-structured interviews with 62 undergraduate students and two lecturers, non-participant observations of students' academic practices after completing the *Scientific Thematic Exegesis* course, and document analysis. The data were analyzed using reflexive thematic analysis and validated through source, methodological, and documentary triangulation. The findings indicate that scientific consciousness is a multidimensional construct comprising three interrelated dimensions: academic consciousness, practical consciousness, and ethical consciousness. Although students generally demonstrated conceptual appreciation of the relationship between the Qur'an and science, methodological understanding, inquiry-oriented scientific practice, and research ethics were unevenly developed. Based on these findings, the study proposes a conceptual framework of scientific consciousness that explains the integration of epistemic understanding, scientific practice, and ethical responsibility within Islamic higher education.

**Keywords:** Scientific Consciousness; Qur'an–Science Integration; *Wahdah al-Ulum*; Islamic Higher Education; Qur'anic Studies and Exegesis; Qualitative Case Study.

## INTRODUCTION

Scientific competence has become an increasingly important objective of higher education because universities are expected to produce graduates who not only understand scientific knowledge but are also able to apply it responsibly in academic and social life. This expectation is particularly relevant in the era of rapid scientific and technological development, where students must critically evaluate evidence, make informed decisions, and uphold academic integrity. Within educational research, however, scientific engagement is commonly examined through constructs such as scientific literacy, scientific reasoning, scientific attitude, or scientific ethics, each of which represents only a specific aspect of students' scientific development (Lederman, 2007; Morris, 2022; Osborne et al., 2003; Roberts, 2007). While these constructs explain cognitive competence, reasoning skills, dispositions, or responsible research conduct, they do not fully explain how students internalize science as an integrated epistemic, practical, and ethical orientation. Building on this limitation, the present study adopts scientific consciousness as a broader construct referring to students' reflective awareness of science that shapes how scientific knowledge is understood, enacted, and ethically practiced within everyday academic life.

The concept of scientific consciousness becomes particularly significant in Islamic higher education, where scientific inquiry is expected to develop in dialogue with



religious knowledge rather than independently from it. Contemporary Islamic educational thought consistently emphasizes the unity of revelation and reason as complementary sources of knowledge. This perspective is reflected in the concepts of *ta'dib* proposed by Al-Attas (Al-Attas (Syed.), 1991), the Islamization of Knowledge project initiated by the International Institute of Islamic Thought, and Abdullah's integrated-interconnected paradigm (Abdullah, 2014; Abu Sulayman, 1989), all of which reject the dichotomy between religious and empirical sciences. At Universitas Islam Negeri Sumatera Utara, This epistemological orientation is also reflected in the Wahdah al-Ulum paradigm adopted by Universitas Islam Negeri Sumatera Utara, which positions all branches of knowledge as interconnected manifestations of divine truth and encourages interdisciplinary learning grounded in Islamic values (Dalimunthe et al., 2024; Lubis, 2021). Within this context, scientific consciousness is understood not merely as mastery of scientific concepts but as the internalization of scientific inquiry, ethical responsibility, and Qur'anic values into students' academic lives.

Previous studies have predominantly examined science-religion integration from philosophical, institutional, or curricular perspectives, explaining how Islamic universities formulate integrative educational paradigms (Abdullah, 2014; Lubis, 2021). Other studies have focused on scientific identity, inquiry-based learning, and students' participation in authentic research experiences, demonstrating that sustained engagement in research strengthens confidence, scientific identity, and inquiry-oriented behaviour (Hinojosa & Egger, 2026; Kim et al., 2026). Despite these contributions, empirical evidence remains limited regarding how students in Islamic higher education actually experience and internalize the integration of the Qur'an and science. Existing studies rarely distinguish scientific consciousness from related constructs such as scientific literacy, scientific reasoning, or scientific ethics, making it difficult to explain how epistemic understanding, scientific practice, and ethical responsibility interact within students' lived academic experiences. Consequently, an important empirical gap remains concerning how future Qur'anic scholars negotiate scientific inquiry within an integrated Islamic educational environment.

Responding to this gap, the present study investigates the scientific consciousness of students in the Department of Qur'anic Studies and Exegesis at Universitas Islam Negeri Sumatera Utara using a qualitative case study approach. The study addresses the following research question: How do students experience and express scientific consciousness within the context of Qur'an-science integration? Rather than measuring scientific competence quantitatively, this research explores how students understand science, translate that understanding into academic and everyday practices, and



internalize ethical responsibility throughout their learning experiences. The study contributes to the literature in two ways. Conceptually, it proposes a multidimensional framework of scientific consciousness consisting of academic consciousness, practical consciousness, and ethical consciousness, thereby distinguishing the construct from related concepts in science education. Empirically, it provides qualitative evidence of how science–religion integration is experienced by students, extending current discussions beyond institutional paradigms toward students’ lived academic practices within Islamic higher education.

## LITERATURE REVIEW

### Scientific Consciousness as a Conceptual Construct

Scientific consciousness has received considerably less theoretical attention than related concepts such as scientific literacy, scientific reasoning, and scientific ethics. While contemporary consciousness studies describe consciousness as a reflective capacity through which individuals interpret experience and regulate intentional action (Lopez & Wiese, 2025; Mudrik et al., 2025), educational research employs the concept to explain how learners internalize scientific ways of thinking and translate scientific understanding into responsible academic behaviour. Accordingly, this study defines scientific consciousness as a multidimensional reflective awareness through which students understand, enact, and ethically internalize scientific knowledge within an integrated Qur’anic worldview. Rather than referring merely to scientific competence, scientific consciousness encompasses epistemic understanding, practical engagement, and ethical responsibility. This conceptualization is particularly relevant within Islamic higher education, where knowledge is viewed not only as cognitive achievement but also as an amanah that carries moral responsibility toward God, humanity, and nature (Abu Sulayman, 1989; Al-Attas (Syed.), 1991).

### Distinguishing Scientific Consciousness from Related Concepts

Scientific consciousness should be distinguished from several related constructs frequently used interchangeably in educational research. Scientific literacy concerns the ability to understand scientific concepts and evaluate evidence, whereas scientific reasoning emphasizes logical evaluation and explanation building. Scientific attitude refers to dispositions such as curiosity, openness, and objectivity, while scientific ethics focuses on responsible scientific conduct through honesty, transparency, and accountability (ALLEA - All European Academies, 2023). Science–religion integration, by contrast, represents an epistemological framework connecting revelation with empirical inquiry (Abdullah, 2014; Lubis, 2021). Although these constructs overlap, none



individually explains how scientific knowledge becomes internalized as a coherent academic disposition. In this study, scientific consciousness is therefore conceptualized as a higher-order construct integrating cognitive understanding, scientific practice, and ethical commitment. This distinction provides the analytical foundation for examining three interrelated dimensions: academic consciousness, practical consciousness, and ethical consciousness.

**Table 1. Distinguishing Scientific Consciousness from Related Concepts**

| Construct                                    | Primary Focus                                                            | Distinction from Scientific Consciousness                                                                             |
|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Scientific literacy</b>                   | Understanding scientific concepts and evidence                           | Focuses on scientific competence rather than reflective internalization.                                              |
| <b>Scientific reasoning</b>                  | Evidence evaluation and explanation                                      | Emphasizes analytical thinking rather than holistic awareness.                                                        |
| <b>Scientific attitude</b>                   | Dispositions toward inquiry                                              | Describes personal tendencies rather than integrated practice.                                                        |
| <b>Science identity</b>                      | Self-identification with scientific communities                          | Concerns identity formation rather than epistemic and ethical integration.                                            |
| <b>Scientific habitus</b>                    | Internalized scientific practices                                        | Explains habitual behaviour rather than reflective consciousness.                                                     |
| <b>Scientific ethics</b>                     | Responsible scientific conduct                                           | Represents the ethical dimension of, but not the entirety of, scientific consciousness.                               |
| <b>Science–religion integration</b>          | Relating revelation and science                                          | Provides the epistemological context rather than students’ lived internalization.                                     |
| <b>Scientific consciousness (this study)</b> | Reflective integration of scientific understanding, practice, and ethics | A multidimensional construct encompassing academic, practical, and ethical consciousness within a Qur’anic worldview. |

### Science–Religion Integration in Islamic Higher Education

The integration of science and religion constitutes one of the defining characteristics of contemporary Islamic higher education in Indonesia. Various State



Islamic Universities have developed institutional paradigms intended to overcome the historical dichotomy between revealed and acquired knowledge. At UIN Sumatera Utara, this objective is articulated through the Wahdah al-Ulum paradigm, which views all branches of knowledge as originating from the same divine source and therefore capable of mutually enriching one another (Lubis, 2021). Similar ideas are reflected in Abdullah's integrated-interconnected paradigm, which promotes dialogue among religious sciences, natural sciences, and the social sciences through interdisciplinary inquiry (Abdullah, 2014). Within this perspective, science-religion integration is not merely a curricular arrangement but an epistemological orientation intended to cultivate graduates who are capable of interpreting scientific knowledge critically while maintaining ethical and religious responsibility. Consequently, successful integration requires not only conceptual understanding but also its manifestation in students' academic practices and scientific conduct.

Previous research on science-religion integration has predominantly examined institutional paradigms, curriculum development, and philosophical models implemented within Islamic universities (Abdullah, 2014; Lubis, 2021). Other studies have investigated scientific identity, inquiry-based learning, and authentic research experiences, demonstrating that participation in scientific communities strengthens students' scientific confidence and identity (Hinojosa & Egger, 2026; Kim et al., 2026; Marin & Lindeman, 2021). Research within Islamic education has likewise explored relationships between religiosity, critical thinking, and students' personal development (Az-Zahra & Darmana, 2023; Hapsari & Darodjat, 2024; Matthews et al., 2023; Sholihuddin et al., 2026; Simuziya, 2022). Although these studies contribute important insights, they generally emphasize institutional implementation, cognitive outcomes, or psychological variables rather than examining how students themselves experience and internalize science-religion integration in their everyday academic lives. Consequently, the behavioural and ethical dimensions of students' scientific consciousness remain insufficiently understood.

The existing literature reveals an important empirical gap. Previous studies have largely focused on institutional models of knowledge integration or on students' scientific competence, whereas limited research has explored how Qur'anic Studies students interpret, enact, and ethically internalize science-religion integration through their lived academic experiences. Moreover, scientific consciousness has rarely been conceptualized as a multidimensional construct connecting epistemic understanding, practical behaviour, and ethical responsibility. Addressing this limitation, the present study adopts scientific consciousness as its principal analytical framework and



operationalizes it through three interconnected dimensions: academic consciousness, practical consciousness, and ethical consciousness. In a broader sense, this conceptual interface must be understood through a transdisciplinary lens where science, religion, and culture continuously yield reciprocal influences within the governance of social polities.

Based on the preceding discussion, this study contributes to the literature in two ways. Empirically, it provides qualitative evidence regarding how students of the Qur'anic Studies and Exegesis Department at UIN Sumatera Utara experience and negotiate science-religion integration in their academic and everyday practices. Conceptually, it proposes scientific consciousness as a multidimensional construct encompassing academic, practical, and ethical dimensions rather than reducing students' engagement with science to scientific literacy or conceptual appreciation alone. Rather than evaluating the effectiveness of institutional policy, this study focuses on students' lived experiences, thereby offering a complementary perspective to previous research on science-religion integration in Islamic higher education. The proposed framework is intended as an analytical model for understanding how scientific knowledge becomes progressively internalized within Qur'anic scholarship through the interaction of epistemic awareness, practical engagement, and ethical responsibility.

## RESEARCH METHODS

This study employed an interpretivist qualitative case study to explore how students of the Qur'anic Studies and Exegesis (IAT) Department at Universitas Islam Negeri Sumatera Utara understand, enact, and ethically internalize the integration of the Qur'an and science within the Wahdah al-Ulum paradigm. A qualitative case study was considered appropriate because it facilitates an in-depth investigation of a contemporary phenomenon situated within its real-life institutional context rather than seeking statistical generalization (Yin, 2017). Participants were selected through maximum variation purposive sampling to capture diverse academic experiences, including academic achievement, research experience, and engagement with science-integrated learning. The study involved 62 undergraduate students who had completed the Scientific Thematic Exegesis (*Tafsir Tematik Sains*) course and two lecturers responsible for teaching the course. Sampling followed the principle of information power, whereby participant recruitment was considered sufficient when the collected data adequately addressed the research objectives (Malterud et al., 2016). Data were collected between April and May 2026 through semi-structured interviews, non-participant observations, and document analysis. Interviews lasted approximately 40–70 minutes, were audio-recorded with participants' informed consent, and transcribed verbatim (Kvale &



Brinkmann, 2015). Because participants had completed the Scientific Thematic Exegesis course during their sixth semester, observations were conducted during the eighth semester and focused on students' academic and everyday scientific practices, including participation in academic discussions, scientific writing activities, use of scholarly references, undergraduate thesis supervision, and observable expressions of science-religion integration within the campus environment. Documentary sources included the course syllabus, learning outcomes, students' assignments, undergraduate thesis guidelines, and institutional policies concerning scientific writing and research ethics. Interview, observational, and documentary evidence were systematically compared to achieve methodological triangulation.

Data were analyzed using reflexive thematic analysis following Braun and Clarke's six-phase procedure of familiarization, coding, theme development, theme review, theme definition, and report writing (Braun & Clarke, 2006). Coding combined inductive identification of patterns emerging from participants' narratives with abductive interpretation informed by the concepts of scientific consciousness, science-religion integration, scientific ethics, and scientific habitus (Timmermans & Tavory, 2012). Cross-case comparison and negative-case analysis were subsequently undertaken to refine the three analytical dimensions of scientific consciousness: academic, practical, and ethical consciousness.

Trustworthiness was established following Lincoln and Guba's criteria through source and method triangulation, participant reflection, peer debriefing, reflexive memo writing, and the maintenance of an audit trail documenting analytical decisions (Lincoln & Guba, 1985). Throughout the study, the researchers maintained reflexive journals to critically examine how their academic backgrounds in Qur'anic studies might influence data interpretation. Ethical approval was obtained from the faculty prior to data collection, and all participants provided written informed consent after receiving information regarding the study's purpose, voluntary participation, confidentiality, and right to withdraw. Student identities were anonymized using participant codes, lecturer quotations were reported with explicit permission, and all digital recordings and transcripts were securely stored in password-protected files accessible only to the research team.

## RESULTS AND DISCUSSION

### Academic Consciousness toward Science

Academic consciousness constitutes the epistemic foundation of scientific consciousness because it reflects how students understand the relationship between Qur'anic revelation and empirical science before such understanding is translated into



practical behaviour and ethical responsibility. As outlined in the conceptual framework (Table 2), this dimension encompasses four interrelated indicators: epistemic understanding, scientific reasoning, methodological awareness, and epistemic orientation. The interview data indicate that participants generally perceived science and the Qur'an as mutually compatible rather than contradictory. Nevertheless, considerable variation emerged regarding how students understood the role of science within Qur'anic studies. While most participants appreciated scientific knowledge as strengthening their understanding of revelation, relatively few described science as an investigative methodology capable of generating new knowledge. These findings suggest that academic consciousness among IAT students is characterized by strong epistemic appreciation but uneven methodological understanding.

**Table 2. Indicators of Academic Consciousness toward Science**

| Indicator                       | Empirical findings                                                                                                                     |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Epistemic understanding</b>  | Students recognized the compatibility between the Qur'an and contemporary scientific knowledge.                                        |
| <b>Scientific reasoning</b>     | Explanations of scientific phenomena remained predominantly descriptive rather than analytical.                                        |
| <b>Methodological awareness</b> | Students demonstrated limited understanding of empirical inquiry as a systematic research process.                                     |
| <b>Epistemic orientation</b>    | Science was commonly positioned as supporting Qur'anic interpretation rather than functioning as an autonomous epistemological method. |

Nearly all student participants acknowledged that scientific knowledge contributes positively to understanding the Qur'an. Rather than perceiving empirical inquiry as a challenge to religious belief, participants consistently described science as reinforcing their confidence in revelation. Scientific explanations concerning cosmology, embryology, and other natural phenomena discussed in the *Scientific Thematic Exegesis (Tafsir Tematik Sains)* subject were repeatedly identified as examples illustrating the harmony between revelation and modern scientific discoveries. One participant explained that learning about the origin of the universe and embryological development strengthened his conviction that the Qur'an contains divine knowledge whose meanings continue to unfold alongside scientific progress (IKS 1, personal communication, April 21, 2026). Another participant similarly stated that scientific discoveries increased appreciation of Qur'anic verses because many contemporary findings appeared consistent with interpretations previously encountered during tafsir courses (IKS 55, personal communication, April 29, 2025). Across the interviews, science was therefore viewed primarily as a means of deepening religious conviction rather than as an alternative source of authority.



Although participants demonstrated consistently positive attitudes toward science, their explanations revealed noticeable differences in the depth of academic consciousness. Several students described science as encouraging closer observation of God's creation and acknowledged that empirical inquiry could enrich Qur'anic interpretation. Others, however, emphasized almost exclusively that science serves to "prove" the truth of the Qur'an. These contrasting responses indicate that students' epistemic orientation develops along a continuum rather than representing a uniform level of understanding. Participants generally demonstrated familiarity with scientific conclusions discussed in relation to Qur'anic verses, yet relatively few explained how scientific knowledge is produced through observation, hypothesis formulation, experimentation, or critical evaluation of evidence. Consequently, students appeared considerably more familiar with the outcomes of scientific inquiry than with the methodological processes through which those outcomes are generated. This distinction suggests that academic consciousness remains predominantly appreciative rather than investigative.

Lecturers' perspectives corroborated the students' accounts while providing additional insight into the factors underlying this pattern. Ashani observed that students increasingly expressed enthusiasm for discussing contemporary scientific perspectives in Qur'anic interpretation; however, they continued to depend heavily on established exegetical literature when constructing academic arguments. According to him, independent integration of empirical evidence into Qur'anic interpretation remained relatively limited because students rarely extended classroom discussions into systematic scientific investigation (S. Ashani, personal communication, April 28, 2026). Ryandi similarly noted that many students continued to experience difficulties critically engaging with classical Arabic references while simultaneously interpreting contemporary scientific literature. These dual challenges limited students' capacity to synthesize traditional exegetical scholarship with empirical evidence in a balanced manner (Ryandi, personal communication, April 21, 2026). Together, the interviews indicate that students have largely internalized the institutional vision of science-religion integration at the conceptual level, although this understanding has not yet been consistently accompanied by methodological competence in scientific inquiry.

Overall, the empirical findings demonstrate that academic consciousness among IAT students is characterized by widespread acceptance of the compatibility between the Qur'an and science but uneven development across its constituent dimensions. Epistemic understanding emerged as the strongest indicator, with students consistently acknowledging the relevance of scientific knowledge for Qur'anic interpretation. By



contrast, scientific reasoning and methodological awareness remained comparatively less developed, as participants seldom described science as a process of inquiry involving systematic observation, evidence evaluation, and knowledge production. These findings indicate that students' scientific consciousness has progressed beyond viewing science and religion as conflicting domains but has not yet fully developed into an investigative epistemic orientation. The following discussion interprets these findings in relation to contemporary theories of scientific consciousness and science-religion integration.

The pattern identified in the findings suggests that students have developed an epistemological openness toward science but have not yet fully internalized scientific inquiry as a methodological practice. Most participants positioned science as evidence that reinforces the truth of the Qur'an rather than as a systematic process for investigating natural phenomena. This distinction indicates that their academic consciousness remains predominantly epistemic-appreciative instead of epistemic-investigative. In other words, students demonstrate awareness of scientific conclusions while showing more limited understanding of how those conclusions are produced through observation, hypothesis testing, evidence evaluation, and critical revision. Such findings support the conceptual distinction proposed in the literature review that scientific consciousness extends beyond scientific literacy or positive scientific attitudes by requiring reflective engagement with the epistemic processes of science. Rather than rejecting empirical inquiry, participants tended to adopt what may be described as a confirmatory orientation, in which science primarily functions to validate religious knowledge instead of serving as an autonomous method for generating new understanding.

This finding also provides an important perspective on the implementation of the *Wahdah al-'Ulum* paradigm in Islamic higher education. The paradigm emphasizes the unity of *ayat qauliyyah* (revealed signs) and *ayat kauniyyah* (natural signs), encouraging reciprocal dialogue between revelation and empirical investigation (Lubis, 2021). However, the empirical evidence indicates that such integration is experienced more strongly at the level of conceptual acceptance than methodological practice. Students generally acknowledged that scientific knowledge enriches Qur'anic interpretation, yet few described using empirical reasoning to formulate research questions or critically reinterpret classical exegetical discussions. This condition echoes Abdullah's integrated-interconnected paradigm, which argues that integration requires interaction among *bayānī*, *burhānī*, and *'irfānī* modes of reasoning rather than the predominance of a single epistemological approach (Abdullah, 2014). In the present study, *bayānī* reasoning remains dominant, while *burhānī* reasoning functions largely as supporting evidence rather than as an equal partner in knowledge production.



These findings therefore indicate that academic consciousness among IAT students represents an intermediate stage in the development of scientific consciousness. Students have largely moved beyond viewing science and religion as contradictory domains and instead recognize their compatibility within an Islamic worldview. Nevertheless, their understanding remains oriented toward appreciating scientific discoveries rather than employing scientific methodology as an integral component of Qur'anic scholarship. This study consequently argues that strengthening academic consciousness requires curricular strategies that extend beyond conceptual discussions of science-religion integration. Inquiry-based learning, collaborative research projects, engagement with empirical literature, and explicit instruction in scientific methodology should become integral components of Qur'anic Studies education. Through such approaches, students may gradually transform science from an object of appreciation into an epistemological instrument capable of generating new interpretations and contributing to the continuing development of Islamic scholarship.

The findings indicate that academic consciousness among IAT students is characterized by a positive epistemic orientation toward science but remains constrained by limited methodological internalization. Most participants no longer perceive science and religion as competing domains. Instead, they regard scientific knowledge as complementary to Qur'anic interpretation, reflecting the success of institutional efforts to promote the Wahdah al-'Ulum paradigm. Nevertheless, students generally positioned science as evidence that confirms revealed truth rather than as an epistemological method capable of producing new knowledge through observation, hypothesis testing, and critical inquiry. This distinction suggests that academic consciousness develops first as an appreciative awareness before evolving into methodological competence. The findings therefore support the conceptual argument advanced in this study that scientific consciousness cannot be reduced to scientific literacy alone but involves the progressive internalization of scientific reasoning within students' academic worldview.

The predominance of confirmatory reasoning also reveals an epistemological pattern frequently identified within discussions of Qur'an-science integration. Rather than employing empirical investigation to formulate new exegetical questions, students commonly interpreted scientific discoveries retrospectively by aligning them with Qur'anic verses. Such a tendency resembles what several scholars describe as a confirmation-oriented approach to science-religion dialogue, in which empirical findings primarily function to reinforce pre-existing theological beliefs instead of stimulating critical inquiry. While this orientation strengthens religious conviction, it limits the development of inquiry-based reasoning that characterizes scientific practice.



Consequently, the integration achieved by students remains largely conceptual, whereas methodological integration—where scientific methods actively contribute to interpretation—has not yet developed consistently.

This pattern is consistent with contemporary discussions regarding the multidimensional nature of consciousness. Lopez and Wiese argue that consciousness develops through increasingly complex forms of reflective information processing rather than existing as a single cognitive state (Lopez & Wiese, 2025). Similarly, Mudrik et al. emphasize that higher levels of consciousness involve the organization of multiple cognitive processes into coherent patterns of understanding and action (Mudrik et al., 2025). Viewed through this perspective, the participants in the present study appear to occupy an intermediate stage of scientific consciousness. They demonstrate awareness of the compatibility between revelation and science but have not yet transformed that awareness into analytical reasoning capable of evaluating empirical evidence independently. Scientific consciousness therefore emerges as a developmental process progressing from recognition, to reflection, and ultimately to methodological engagement.

The findings likewise enrich discussions of science–religion integration in Islamic higher education. Abdullah’s integrated-interconnected paradigm proposes that religious and scientific disciplines should interact reciprocally rather than hierarchically (Abdullah, 2014). However, the present findings suggest that this reciprocal interaction remains incomplete at the student level. Bayānī reasoning continues to dominate students’ academic orientation, whereas burhānī reasoning functions primarily as supporting evidence rather than as an autonomous mode of inquiry. Consequently, integration tends to remain rhetorical despite students’ positive attitudes toward scientific knowledge. These findings therefore indicate that institutional paradigms alone are insufficient to cultivate scientific consciousness unless accompanied by pedagogical strategies that explicitly develop empirical reasoning, research competence, and interdisciplinary investigation.

Another important implication concerns the distinction between scientific knowledge and scientific habitus. Students generally demonstrated familiarity with scientific explanations associated with Qur’anic verses, yet relatively few explained how scientific knowledge is produced through observation, experimentation, and critical evaluation of evidence. This finding corresponds with educational research showing that inquiry-based learning and authentic research experiences are essential for strengthening students’ scientific identity and long-term engagement with science (Hinojosa & Egger, 2026; Kim et al., 2026; Riza & Yusniah, 2025). Knowledge acquisition alone does not



automatically produce scientific consciousness unless students repeatedly experience science as a process of investigation. This multi-source approach aligns with goal systems theory in psychology, which suggests that religious individuals naturally use both science and religion as alternative pathways to knowledge, effectively avoiding extreme epistemic reliance on any single framework (Jackson et al., 2025). Thus, the challenge facing Qur'anic Studies programs is not merely expanding scientific content but creating opportunities for students to practice scientific inquiry as part of their academic formation.

Overall, this study argues that academic consciousness among IAT students remains predominantly appreciative rather than investigative. Students have largely accepted the compatibility between science and the Qur'an and regard scientific knowledge as reinforcing religious understanding. However, their awareness has not yet matured into methodological competence characterized by independent inquiry, critical evaluation of evidence, and empirical knowledge production. This finding extends previous discussions on science-religion integration by demonstrating that epistemological acceptance does not necessarily lead to scientific reasoning. Accordingly, strengthening academic consciousness requires curricular strategies that integrate scientific methodology, inquiry-based learning, and interdisciplinary research experiences so that science functions not only as confirmation of revelation but also as a legitimate epistemic instrument for exploring God's creation.

### **Practical Consciousness toward Science**

Practical consciousness refers to the extent to which students translate their understanding of Qur'an-science integration into observable academic and everyday practices. While academic consciousness reflects students' epistemic understanding, practical consciousness concerns whether such understanding influences their behaviour beyond conceptual appreciation. Interview and observational data indicate that students generally accepted scientific explanations related to Islamic teachings, but the degree to which these explanations shaped their daily practices varied considerably. Practical consciousness appeared strongest in behaviours already embedded within Islamic religious traditions, whereas practices requiring independent scientific inquiry were less consistently demonstrated. To summarize the empirical findings, participants' responses were categorized into four recurring forms of practical consciousness (Table 3).



**Table 3. Forms of Practical Consciousness among IAT Students**

| Scientific Context                               | Representative Practice                                                       | Dominant Orientation |
|--------------------------------------------------|-------------------------------------------------------------------------------|----------------------|
| <b>Ritual purification</b><br>( <i>ṭahārah</i> ) | Using flowing water while recognizing hygienic benefits                       | Reflective-praxis    |
| <b>Healthy lifestyle</b>                         | Choosing <i>halālan ṭayyiban</i> food by considering nutritional quality      | Adaptive             |
| <b>Observation of nature</b>                     | Observing lunar phases or plant growth mainly for academic assignments        | Instrumental         |
| <b>Personal hygiene</b>                          | Applying prophetic health practices while recognizing scientific explanations | Reflective-praxis    |

Interview findings demonstrate that students most frequently connected scientific knowledge with religious practices that had already become part of their everyday lives. Several participants explained that they preferred using flowing water during ritual purification because they believed it was more effective in maintaining cleanliness and reducing contamination. Likewise, students associated the concept of *halālan ṭayyiban* not only with religious permissibility but also with nutritional quality and healthy dietary habits (IKS 29, personal communication, April 24, 2026). These responses illustrate participants' own interpretations of religious practice rather than objective scientific validation, yet they indicate an emerging tendency to understand religious observance through scientific explanations.

Observation data largely confirmed these interview accounts. During campus activities, students consistently demonstrated personal hygiene practices and frequently referred to health-related religious teachings when discussing everyday behaviour. However, these practices appeared to arise primarily from religious commitment rather than from deliberate engagement with scientific inquiry. Scientific explanations were generally introduced after the behaviour had already been adopted, suggesting that science functioned as a complementary justification rather than the principal motivation for action.

A different pattern emerged in relation to inquiry-oriented scientific activities. Students acknowledged that observations of natural phenomena, including lunar phases, environmental changes, and plant growth, were conducted mainly to fulfil academic assignments completed during the Scientific Thematic Exegesis (*Tafsir Tematik Sains*) course. After completing the course, few participants reported continuing such observations independently. Field observations undertaken during participants' eighth



semester similarly revealed limited evidence of spontaneous scientific investigation within their routine academic activities.

Lecturers provided comparable assessments of students' practical engagement with science. Ashani observed that students actively participated in classroom discussions concerning scientific interpretations of Qur'anic verses but rarely extended those discussions into independent observation or small-scale empirical inquiry after course completion (S. Ashani, personal communication, April 28, 2026). Ryandi likewise explained that opportunities for laboratory activities and structured field investigations remained limited within the programme, reducing students' exposure to authentic scientific practice (Ryandi, personal communication, April 21, 2026).

Document analysis further supports these findings. The syllabus of the Scientific Thematic Exegesis course includes learning outcomes related to observing natural phenomena and integrating empirical evidence into Qur'anic interpretation. Nevertheless, these activities are concentrated within the course itself and are not systematically reinforced throughout subsequent semesters. Consequently, students encounter relatively few opportunities to maintain inquiry-oriented behaviours after completing the course.

Taken together, interviews, observations, and documentary evidence indicate that practical consciousness among IAT students is unevenly distributed across different domains of experience. Students consistently integrate scientific explanations into familiar religious practices, whereas independent scientific observation and inquiry remain largely contextual, assignment-driven, and discontinuous after formal instruction.

The findings suggest that practical consciousness develops more slowly than academic consciousness because behavioural transformation requires repeated experience rather than conceptual understanding alone. Students generally demonstrated positive attitudes toward scientific explanations and were able to relate them to everyday religious practices. However, these practices were predominantly maintained through religious commitment, while scientific reasoning functioned as an additional explanatory framework. Consequently, students' practical consciousness remained strongest where scientific explanations reinforced established religious routines rather than where science demanded independent investigation.

This pattern aligns closely with Experiential Learning Theory, which proposes that meaningful learning emerges through recurring cycles of concrete experience, reflective observation, conceptualization, and active experimentation (Kolb et al., 2001). Although participants had previously completed the Scientific Thematic Exegesis course,



opportunities to continue inquiry-oriented activities beyond formal instruction appeared limited. As a result, scientific understanding remained primarily conceptual instead of developing into enduring behavioural habits. The findings therefore suggest that exposure to scientific concepts alone is insufficient for cultivating sustained practical consciousness without continuous opportunities for authentic engagement.

The present findings also contribute to current discussions on scientific habitus. Bourdieu's concept of habitus suggests that dispositions become durable only through repeated social practice rather than isolated educational experiences. Similarly, scientific habitus develops when scientific inquiry becomes embedded within everyday academic routines instead of remaining confined to classroom assignments. In the present study, inquiry-oriented behaviours appeared episodic rather than habitual. Students participated in observation and research activities during the course but seldom continued these practices independently afterwards, indicating that scientific dispositions had not yet become fully internalized within their academic lives.

Recent educational research similarly emphasizes that authentic research experiences are central to developing long-term engagement with science. Hinojosa and Egger demonstrate that inquiry-based learning strengthens students' confidence in applying scientific reasoning (Hinojosa & Egger, 2026), whereas Kim et al. show that participation in research communities contributes significantly to the development of science identity (Kim et al., 2026). Compared with these studies, the present findings indicate that IAT students possess favourable attitudes toward science but experience relatively limited opportunities for sustained empirical engagement. The challenge therefore lies less in students' willingness to integrate science and religion than in the continuity of learning experiences available after completing science-integrated coursework.

These findings also illuminate the implementation of the Wahdah al-'Ulum paradigm. Although students consistently related scientific explanations to religious practices, empirical inquiry remained secondary to normative religious behaviour. Bayānī reasoning therefore continued to dominate practical decision-making, while burhānī reasoning functioned primarily as supporting interpretation rather than as an investigative method. This imbalance suggests that institutional narratives promoting integration have successfully influenced students' conceptual orientation but have not yet transformed empirical inquiry into a regular academic practice.

Overall, this study indicates that practical consciousness among IAT students remains partially internalized. Students successfully incorporate scientific explanations into familiar religious practices, yet inquiry-oriented behaviours characteristic of



scientific investigation have not developed consistently beyond formal coursework. These findings extend the earlier discussion on academic consciousness by demonstrating that limitations in methodological understanding are reflected not only in students' academic reasoning but also in their everyday practices. Strengthening practical consciousness therefore requires curricular strategies that provide sustained opportunities for inquiry-based learning, field observation, collaborative research, and reflective practice so that science becomes both a method of investigation and a lived academic disposition.

### Ethical Consciousness toward Science

Ethical consciousness represents the culmination of scientific consciousness because it concerns how students internalize scientific values into academic responsibility, intellectual integrity, and personal conduct. Whereas academic consciousness reflects students' epistemic understanding and practical consciousness concerns the enactment of scientific knowledge, ethical consciousness addresses the moral commitments that regulate knowledge production. Within the context of Qur'anic Studies and Exegesis, this dimension encompasses honesty, responsibility, critical reflection, and accountability as integral components of scholarly life. The interview data indicate that ethical consciousness is expressed through four recurring patterns: spiritual reflection, reflective inquiry, academic integrity, and ethical lifestyle.

The principal forms of ethical consciousness identified in this study are summarized in Table 4.

**Table 4. Forms of Ethical Consciousness among IAT Students**

| Ethical Dimension           | Representative Behaviour                                        | Level of Internalization |
|-----------------------------|-----------------------------------------------------------------|--------------------------|
| <b>Spiritual reflection</b> | Scientific discoveries strengthen faith in God                  | Reflective               |
| <b>Reflective inquiry</b>   | Natural phenomena stimulate contemplation of Qur'anic verses    | Reflective-cognitive     |
| <b>Academic integrity</b>   | Awareness of proper citation and scholarly responsibility       | Developing               |
| <b>Ethical lifestyle</b>    | Scientific understanding influences responsible daily behaviour | Moderate                 |

Interview findings demonstrate that spiritual reflection constitutes the strongest expression of ethical consciousness. Many participants explained that scientific discoveries increased their appreciation of the Qur'an and reinforced their belief that revelation and scientific knowledge originate from the same divine source. One participant stated that contemporary scientific findings strengthened his conviction that



the Qur'an is *kalamullah*, encouraging greater gratitude and religious commitment (IKS 38, personal communication, April 25, 2026). Another participant explained that observing heavy rainfall often prompted reflection on Qur'anic descriptions of the hydrological cycle, transforming ordinary natural events into occasions for contemplating God's creation (IKS 43, personal communication, April 25, 2026).

A second pattern concerns reflective inquiry. Students frequently reported that learning scientific explanations encouraged them to observe natural phenomena more thoughtfully and to interpret Qur'anic verses within broader environmental and scientific contexts. Although these reflections rarely developed into systematic empirical investigation, participants consistently described science as deepening their appreciation of both revelation and the natural world. Ethical consciousness therefore appeared closely associated with reflective awareness rather than with research practice itself.

Observation data similarly revealed that participants commonly expressed ethical sensitivity when discussing environmental stewardship, healthy lifestyles, and responsible use of natural resources. During informal discussions and academic activities, students frequently related contemporary environmental issues to Islamic ethical teachings. Nevertheless, these reflections generally remained normative and were only occasionally accompanied by references to empirical evidence or scientific investigation. Ethical awareness thus appeared more visible in moral discourse than in research-oriented activities.

A different pattern emerged when ethical consciousness was examined through students' academic practices. Lecturer interviews consistently identified academic integrity as an area requiring further development. Ryandi explained that some student assignments still contained weaknesses in citation accuracy, source verification, and scholarly attribution. Rather than describing these issues as deliberate academic misconduct, he viewed them as indicators that students required more systematic guidance regarding responsible research practices (Ryandi, personal communication, April 21, 2026). Ashani likewise emphasized that appreciation of scientific interpretations of the Qur'an should always be accompanied by honesty, transparency, and methodological rigour in academic writing (S. Ashani, personal communication, April 28, 2026).

Document analysis supports these observations. Institutional guidelines governing undergraduate theses explicitly emphasize originality, appropriate citation practices, and responsible use of scholarly references. Course documents likewise include learning outcomes related to academic ethics and scientific writing. However, interview and observational data suggest that students' understanding of these principles develops



unevenly, particularly when they begin conducting independent research during the final stages of their undergraduate studies.

Taken together, interviews, observations, and documentary evidence indicate that ethical consciousness among IAT students is characterized by strong spiritual reflection but less consistent academic implementation. Students generally recognize that scientific knowledge should strengthen faith and encourage responsible behaviour, yet the application of ethical principles within research practice remains in an ongoing process of development. This ethical orientation is also compatible with broader discussions in Islamic scholarship that position scientific responsibility as inseparable from environmental stewardship and social accountability (Arsyad et al., 2025).

The findings indicate that ethical consciousness develops differently from academic and practical consciousness because it concerns the internalization of values rather than the acquisition of knowledge or behavioural competence alone. Students consistently described scientific knowledge as strengthening faith and encouraging gratitude toward God, suggesting that ethical consciousness initially emerges through spiritual reflection. However, this reflective awareness was not always accompanied by equally strong academic practices related to research integrity. The findings therefore demonstrate that ethical appreciation and ethical implementation represent distinct stages in the development of scientific consciousness.

This distinction corresponds closely with contemporary frameworks of research integrity. The European Code of Conduct for Research Integrity identifies honesty, reliability, respect, and accountability as the normative foundations of responsible scientific practice (ALLEA - All European Academies, 2023). These principles extend beyond avoiding plagiarism to include transparent reporting, responsible interpretation of evidence, accurate citation, and respect for intellectual contributions. Viewed from this perspective, ethical consciousness cannot be assessed solely through students' religious commitment or moral reflection. Rather, it becomes visible when ethical values consistently guide the production and communication of scientific knowledge.

The findings likewise resonate with UNESCO's Recommendation on Open Science, which emphasizes transparency, collaboration, accessibility, and public responsibility as fundamental characteristics of contemporary scientific culture (UNESCO, 2021). Although developed primarily for global scientific communities, these principles are equally relevant within Islamic higher education because meaningful integration between revelation and science depends upon intellectual openness and methodological accountability. Students who critically evaluate evidence while



maintaining scholarly honesty contribute not only to academic quality but also to public trust in scientific and religious scholarship.

From the perspective of Islamic higher education, ethical consciousness represents the convergence of epistemic competence and moral responsibility. The Wahdah al-'Ulum paradigm views knowledge as a unified trust originating from God, implying that scientific inquiry should always be accompanied by ethical responsibility. Likewise, Abdullah's integrative-interconnected paradigm emphasizes that religious sciences and empirical sciences should interact through reciprocal dialogue grounded in academic integrity (Abdullah, 2014). The present findings indicate that students have largely embraced this ethical ideal conceptually, although its consistent implementation in research practice remains a continuing educational challenge.

An important implication emerging from this study is that ethical consciousness functions as the dimension that integrates academic understanding with practical action. Students may understand scientific concepts and participate in science-related activities, yet scientific consciousness cannot be considered fully developed unless these experiences are accompanied by honesty, transparency, and accountability throughout the research process. Ethical consciousness therefore acts as the normative mechanism through which scientific knowledge acquires scholarly credibility and social legitimacy.

Overall, the findings suggest that ethical consciousness among IAT students remains predominantly reflective rather than fully operational. Participants consistently associated scientific knowledge with spiritual growth and moral responsibility, but these values were not always translated into systematic research practices characterized by methodological rigour and academic integrity. This study therefore argues that ethical consciousness constitutes the culminating dimension of scientific consciousness because it integrates epistemic understanding, practical engagement, and moral responsibility into a coherent scholarly disposition. Strengthening this dimension requires embedding research ethics, responsible scientific writing, and integrity-based learning experiences throughout the curriculum so that future Qur'anic scholars develop not only scientific competence but also enduring ethical responsibility.

### **A Conceptual Framework of Scientific Consciousness in Qur'anic Studies**

The findings presented in the preceding sections indicate that scientific consciousness cannot be adequately explained through a single dimension such as scientific literacy, scientific attitudes, or science-religion integration alone. Instead, the empirical evidence demonstrates that students' experiences are organized around three interconnected dimensions: academic consciousness, practical consciousness, and ethical consciousness. These dimensions emerged inductively from the interview, observation,



and documentary data and collectively explain how students understand, enact, and internalize the relationship between the Qur'an and science within the context of Islamic higher education.

Academic consciousness forms the epistemic foundation of the framework because it determines how students conceptualize scientific knowledge in relation to Qur'anic interpretation. The findings show that participants generally acknowledge the compatibility of science and revelation but continue to position science primarily as confirmatory evidence rather than as an independent methodology for investigating natural phenomena. Practical consciousness represents the behavioral manifestation of this epistemic orientation. Although students incorporate scientific explanations into several religious practices, inquiry-oriented behaviours remain largely confined to formal academic assignments. Ethical consciousness constitutes the normative dimension through which scientific understanding and practice are regulated by values of honesty, responsibility, transparency, and scholarly integrity. Together, these findings demonstrate that development across the three dimensions is uneven and that progress within one dimension does not necessarily imply comparable development in the others. The relationships among these dimensions are summarized in Table 5.

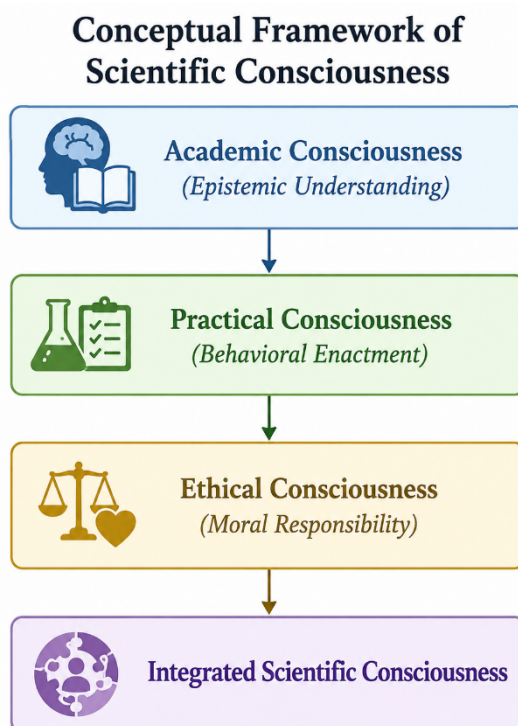
**Table 5. Proposed Framework of Scientific Consciousness among IAT Students**

| Dimension                       | Core Orientation                               | Empirical Characteristic                                                 |
|---------------------------------|------------------------------------------------|--------------------------------------------------------------------------|
| <b>Academic consciousness</b>   | Epistemic understanding                        | Appreciation of science exceeds methodological competence                |
| <b>Practical consciousness</b>  | Behavioral enactment                           | Religious practice is stronger than inquiry-oriented scientific practice |
| <b>Ethical consciousness</b>    | Moral responsibility                           | Spiritual reflection exceeds operational research integrity              |
| <b>Scientific consciousness</b> | Integration of knowledge, practice, and ethics | Developing and uneven across the three dimensions                        |

Rather than representing discrete categories, the three dimensions constitute an interconnected developmental process. Scientific consciousness therefore emerges through the continuous interaction between epistemic understanding, practical experience, and ethical responsibility rather than through the accumulation of scientific knowledge alone. Figure 1 illustrates the conceptual relationship identified in this study.



**Figure 1. Conceptual Framework of Scientific Consciousness**



The proposed framework contributes to the literature in two important respects. First, previous studies of science–religion integration have primarily examined philosophical paradigms, institutional policies, and curriculum models (Abdullah, 2014; Lubis, 2021), whereas relatively little empirical attention has been devoted to how students themselves experience and internalize such integration. The present findings demonstrate that accepting the compatibility between science and religion does not automatically produce inquiry-oriented behaviour or responsible research practice. Instead, scientific consciousness develops through a gradual process in which epistemic understanding, practical experience, and ethical formation mutually reinforce one another.

Second, this study extends contemporary discussions of scientific literacy by proposing scientific consciousness as a broader educational construct. Whereas scientific literacy primarily concerns scientific knowledge and competencies, scientific consciousness encompasses reflective epistemic awareness, inquiry-oriented practice, and ethical responsibility within an integrated Qur’anic worldview. In this sense, science–religion integration should be understood not merely as an epistemological discourse but as an educational process through which students progressively develop



the capacity to understand science critically, apply it responsibly, and uphold scholarly integrity in the production of knowledge.

Finally, the framework should be regarded as an analytical model derived from a qualitative case study rather than as a universal developmental sequence. Because it emerged from a single institutional context, its transferability requires examination in other Islamic higher education settings with different curricular traditions and integration paradigms. Comparative qualitative studies and mixed-method investigations would therefore be valuable for refining the construct of scientific consciousness and examining its applicability across broader contexts of science–religion integration.

The results and discussion in an article or thesis can vary depending on the scope of the problem and the methodology used in the study. In qualitative research the discussion presents systematically the relevant theories and data collected. Then, based on a clear methodology, the data is critically analyzed in order to obtain answers to the core research problems. The format of the results of the research and discussion is not separated, given the limited number of pages available to the author.

## CONCLUSION

This study explored how students in the Qur’anic Studies and Exegesis (IAT) Department at Universitas Islam Negeri Sumatera Utara develop scientific consciousness within the context of Qur’an–science integration under the *Wahdah al-Ulum* paradigm. The findings demonstrate that scientific consciousness is a multidimensional construct comprising three interconnected dimensions: academic consciousness, practical consciousness, and ethical consciousness. These dimensions develop unevenly rather than simultaneously. Most students demonstrated positive epistemic awareness of the relationship between the Qur’an and science and generally perceived scientific knowledge as reinforcing religious belief. However, this awareness remained predominantly appreciative, while inquiry-oriented scientific practice and research integrity were less consistently internalized. The findings therefore suggest that recognizing the compatibility of science and religion does not automatically lead to methodological competence, inquiry-based behaviour, or ethical scientific practice.

The study contributes to the literature by proposing a conceptual framework that positions scientific consciousness as a broader construct than scientific literacy, scientific reasoning, or science–religion integration alone. Rather than focusing solely on scientific competence or institutional integration models, the framework explains how students progressively internalize scientific knowledge through epistemic understanding, practical engagement, and ethical responsibility. This perspective extends previous



discussions of science–religion integration by demonstrating that successful integration depends not only on philosophical or curricular discourse but also on students’ lived academic experiences, research participation, and the cultivation of scholarly integrity. Practically, the findings highlight the importance of embedding inquiry-based learning, field observation, undergraduate research, scientific writing, and research ethics systematically within Qur’anic Studies curricula to strengthen students’ scientific consciousness beyond conceptual appreciation.

This study is limited to a qualitative case study conducted within a single Islamic higher education institution, and the proposed framework should therefore be understood as an analytical model rather than a universally applicable developmental sequence. Future research may examine the transferability of this framework across different Islamic universities, compare diverse models of science–religion integration, and develop quantitative or mixed-method instruments to investigate the relationships between scientific consciousness, research experience, scientific identity, and academic integrity. Such studies would further refine the conceptual boundaries of scientific consciousness and contribute to strengthening science–religion integration within contemporary Islamic higher education.

## Bibliography

1. Abdullah, M. A. (2014). Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science. *Al-Jami'ah: Journal of Islamic Studies*, 52(1), 175–203. <https://doi.org/10.14421/ajis.2014.521.175-203>
2. Abu Sulayman, A. (Ed.). (1989). *Islamization of Knowledge* (2nd ed., Vol. 1). The International Institute of Islamic Thought (IIIT).
3. Al-Attas (Syed.), M. N. (1991). *The Concept of Education in Islam: A Framework for an Islamic Philosophy of Education*. International Institute of Islamic Thought and Civilization.
4. ALLEA - All European Academies. (2023). *The European Code of Conduct for Research Integrity*. ALLEA - All European Academies. <https://doi.org/10.26356/ECOC>
5. Arsyad, M., Koeswahyono, I., & Qurbani, I. D. (2025). Reformulating Conservation Policies For Indigenous Peoples In Indonesia. *International Journal of Islamic Education, Research and Multiculturalism (IJIERM)*, 7(2), 829–847. <https://doi.org/10.47006/ijierm.v7i2.489>
6. Az-Zahra, S. A., & Darmana, A. (2023). The Relationship of Religiosity with Students’ Critical Thinking Skills on the Subject of Stoichiometry. *Jurnal Inovasi Pembelajaran Kimia*, 5(2), 163–173. <https://doi.org/10.24114/jipk.v5i2.56227>
7. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>



8. Dalimunthe, A. Q., Salminawati, Usiono, & Sinulingga, N. N. (2024). Islamic Education in the Perspective of the International World Muslim Conference on Education Ontological, Epistemological, axiological examination. *International Journal of Islamic Education, Research and Multiculturalism (IJIERM)*, 6(1), 1-17. <https://doi.org/10.47006/ijierm.v6i1.286>
9. Hapsari, P., & Darodjat. (2024). Correlation Between Islamic Religiosity and Mental Well-Being in Students in the Perspective of Achieving Sustainable Development Goals (SDGs). *Profetika: Jurnal Studi Islam*, 25(02), 363-374. <https://doi.org/10.23917/profetika.v25i02.4363>
10. Hinojosa, L., & Egger, A. E. (2026). Building students' science identity in introductory undergraduate science courses. *International Journal of Science Education*, 0(0), 1-19. <https://doi.org/10.1080/09500693.2026.2661392>
11. Jackson, J. C., Jasko, K., Abrams, S., Atkinson, T., Balkcom, E., Kruglanski, A., Gray, K., & Halberstadt, J. (2025). Religious people view both science and religion as less epistemically valuable than non-religious people view science. *Religion, Brain & Behavior*, 15(4), 374-399. <https://doi.org/10.1080/2153599X.2024.2363750>
12. Kim, A. Y., Mendoza, R., & Chun, C.-A. (2026). Fostering Scientist Identity Development and Compatibility in an Undergraduate Research Experience Program. *Science Education*, 110(2), 459-478. <https://doi.org/10.1002/sce.70014>
13. Kolb, D. A., Boyatzis, R. E., & Mainemelis, C. (2001). Experiential learning theory: Previous research and new directions. In *Perspectives on thinking, learning, and cognitive styles* (pp. 227-247). Lawrence Erlbaum Associates Publishers.
14. Kvale, S., & Brinkmann, S. (2015). *Interviews Learning the Craft of Qualitative Research Interviewing* (3rd ed.). SAGE Publications.
15. Lederman, N. G. (2007). Nature of Science: Past, Present, and Future. In *Handbook of Research on Science Education*. Routledge.
16. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. SAGE.
17. Lopez, A., & Wiese, W. (2025). Building blocks for theories of consciousness. *Consciousness and Cognition*, 134, 103919. <https://doi.org/10.1016/j.concog.2025.103919>
18. Lubis, R. R. (2021). Universitas Islam Negeri (Studi Historisitas, Perkembangan dan Model Integrasi Keilmuan). *Hikmah*, 18(2), 150-167. <https://doi.org/10.53802/hikmah.v18i2.128>
19. Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qualitative Health Research*, 26(13), 1753-1760. <https://doi.org/10.1177/1049732315617444>
20. Marin, P., & Lindeman, M. (2021). How do people perceive the relationship between science and religion? The roles of epistemic and ontological cognition. *Applied Cognitive Psychology*, 35(5), 1146-1157. <https://doi.org/10.1002/acp.3836>
21. Matthews, L. J., Hertzog, W. B., Kyritsis, T., & Kerber, R. (2023). Magic, Religion, and Science: Secularization Trends and Continued Coexistence. *Journal for the Scientific Study of Religion*, 62(1), 5-27. <https://doi.org/10.1111/jssr.12813>



22. Morris, S. (2022). The Rise of Medicalised Mindfulness During the 1970s and 1980s: The Attempted Convergence of Religion and Science. *Brief Encounters*, 1(6). <https://doi.org/10.24134/be.v6i1.296>
23. Mudrik, L., Boly, M., Dehaene, S., Fleming, S. M., Lamme, V., Seth, A., & Melloni, L. (2025). Unpacking the complexities of consciousness: Theories and reflections. *Neuroscience & Biobehavioral Reviews*, 170, 106053. <https://doi.org/10.1016/j.neubiorev.2025.106053>
24. Osborne, J., Simon, S., & Collins, S. (2003). Attitudes towards science: A review of the literature and its implications. *International Journal of Science Education*, 25(9), 1049–1079. <https://doi.org/10.1080/0950069032000032199>
25. Riza, M. R., & Yusniah. (2025). Analysis of Culture Shock in Cross-Cultural Communication of Local and Immigrant Students in The Faculty of Social Sciences, State Islamic University of North Sumatra. *International Journal of Islamic Education, Research and Multiculturalism (IJIERM)*, 7(2), 687–703. <https://doi.org/10.47006/ijierm.v7i2.519>
26. Roberts, D. A. (2007). Scientific Literacy/Science Literacy. In *Handbook of Research on Science Education*. Routledge.
27. Sholihuddin, M., Lubab, N., & Hamid, J. A. (2026). Applied Islamic Values in the Practice of Religious Moderation For Students of Islamic Boarding School Students in Lasem District. *International Journal of Islamic Education, Research and Multiculturalism (IJIERM)*, 8(1), 27–50. <https://doi.org/10.47006/ijierm.v8i1.654>
28. Simuziya, N. J. (2022). A conceptual analysis of how science, religion, and culture interact and influence each other in politics. *Cogent Social Sciences*, 8(1), 2084892. <https://doi.org/10.1080/23311886.2022.2084892>
29. Timmermans, S., & Tavory, I. (2012). Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis. *Sociological Theory*, 30(3), 167–186. <https://doi.org/10.1177/0735275112457914>
30. UNESCO. (2021). *UNESCO Recommendation on Open Science*. UNESCO. <https://doi.org/10.54677/MNMFH8546>
31. Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods* (6th ed.). SAGE Publications.

