Journal of Management, Education and Communication
Vol. 4, No. 1, March 2026
eISSN: 2987-4041
Website: http://journal.dimarjayapublishing.com/index.php/jmec

OSMAN BAKAR'S THOUGHTS ON TAWHID AND IMPLICATIONS FOR ISLAMIC EDUCATION IN INDONESIA

Moh. Hanif Adzhar
Universitas Islam Negeri Syekh Wasil, Kediri, Indonesia
hanifadzhar601@gmail.com

Muhammad Zidni Ilman Nafi'a
Universitas Trunodjoyo Madura, Bangkalan, Indonesia
zidni.ilman@trunojoyo.ac.id

Article Info

Article history:
Received: 5th January 2026
Accepted: 7th February 2026
Published: 1st March 2026

Page: 42-60

Keyword:
Osman Bakar, Tawhid, Islamic Education

Corresponding Author
Moh. Hanif Adzhar

Abstract

The dichotomy between religious sciences and general sciences within contemporary Islamic education systems constitutes a pressing epistemological problem that demands resolution. This study aims to analyze Osman Bakar's concept of Tawhid and its implications for the development of Islamic educational thought. A qualitative library research design was employed, using content analysis and hermeneutical approaches to four of Osman Bakar's primary works published between 1994 and 2018, alongside secondary sources comprising journals and conference proceedings from 2020 to 2025, purposively selected for thematic relevance. This study finds that Tawhid, within Osman Bakar's intellectual framework, operates beyond a mere theological doctrine, functioning instead as a fully operational epistemological system that unifies modern scientific knowledge with Islamic spiritual values. The concepts of the hierarchy of knowledge and dual consilience formulated by Bakar are directly translatable to the design of integrative Islamic educational curricula. This study is limited to a textual analysis of a single thinker's primary works and does not include empirical validation of curriculum implementation in actual educational institutions, indicating a need for further field-based research. This study contributes a tawhidic epistemology framework comprising the hierarchy of knowledge and dual consilience as a novel analytical instrument for designing integrative curricula in contemporary Islamic higher education.

Editorial Office JMEC – Dimar Jaya Publishing:
Jl. Margorejo Masjid No. 11D Kota Surabaya, Provinsi Jawa Timur, 60237.
E-mail: jmec@dimarjayapublishing.com

Introduction

The relationship between science and religion throughout modern civilization has exhibited a fundamental epistemological tension.[1] Modernity introduced a secular mindset that separates the spiritual realm from rationality, causing science to develop without being bound by divine values.[2] The model of separating religious studies from the general sciences was subsequently adopted by educational systems in various countries, including Indonesia.[3] This condition is commonly referred to as the dichotomy of knowledge, a perspective that positions religious studies as a sacred entity, while science and technology are perceived as secular matters. This separation erodes students' spiritual foundation in the learning process, ultimately resulting in an unbalanced character.

The dichotomy of knowledge is a crucial issue because it directly contradicts the principle of Tawhid, which affirms the unity of faith and knowledge.[4] The history of Islamic civilization records that the pinnacle of intellectual glory was achieved precisely when science and religion operated synergistically. Muslim scholars such as Ibn Sina, al-Farabi, and al-Ghazali successfully developed various branches of knowledge on a solid spiritual foundation.[5] Since the colonial era and the introduction of the Western education system, a perspective that separates science from revelatory sources has taken root, causing the integration between the two to gradually fade.[6]

In response to this dichotomy, several contemporary Muslim thinkers have formulated concepts that seek to reunite science with religious teachings.[7] Prof. Osman Bakar, an Islamic philosopher of science from Malaysia, is one of the figures who have made significant contributions in this regard.[8] He developed the idea of integrating science and religion through the approaches of Tawhid and Islamic cosmology. Osman Bakar positions the principle of Tawhid, the unity of the relationship between God, the universe, and humanity, as the epistemological foundation of the structure of science within the Islamic

[1] Muhammad Feri Fernadi, "Discourse of Contemporary Islamic Education: Dichotomy, Islamization, and Integration of Science," *Scaffolding: Jurnal Pendidikan Islam Dan Multikulturalisme* 6, no. 3 (June 2025): 479–90, https://doi.org/10.37680/scaffolding.v7i1.1988.

[2] Achmad Jasuli Afandi et al., "Reconstruction of the Epistemology of Contemporary Islamic Education: Integrating Bayani, Burhani and Irfani Beyond the Dichotomy of Knowledge," *TA'DIB: Jurnal Pendidikan Agama Islam* 4, no. 1 (May 2026): 272–94, https://doi.org/10.69768/jt.v4i1.149.

[3] Riza Adrian Soedardi, "Does Religion Matter? Understanding Religion Subject for Formal Education," *At-Tarbawi: Jurnal Kajian Kependidikan Islam* 4, no. 2 (December 2019): 104, https://doi.org/10.22515/attarbawi.v4i2.1927.

[4] Abd. Basir et al., "Enhancing Qur'an Reading Proficiency in Madrasahs Through Teaching Strategies," *Nazhruna: Jurnal Pendidikan Islam* 7, no. 2 (June 2024): 373–89, https://doi.org/10.31538/nzh.v7i2.4985; Komaruddin Sassi, "Prinsip-Prinsip Epistemologi Pendidikan Islam Paradigma Tauhid Naquib al-Attas," *Millah* 20, no. 1 (August 2020): 135–72, https://doi.org/10.20885/millah.vol20.iss1.art6.

[5] Alif Rohmad and Zainuddin Fanani, "Theology, Mysticism, and the Transformation of Science and Knowledge in Islamic Civilization in the Abbasid Era," *AL-WIJDÃN Journal of Islamic Education Studies* 10, no. 2 (April 2025): 296–323, https://doi.org/10.58788/alwijdn.v10i2.6473; Subaidi Subaidi et al., "Models of Student Care in the Digital Age: Perspectives of Imam Al-Ghazali and Burhanuddin Al-Zarnuji," *Attaqwa: Jurnal Ilmu Pendidikan Islam* 22, no. 1 (March 2026): 13–27, https://doi.org/10.54069/attaqwa.v22i1.1150.

[6] Sarkowi Sarkowi, "Islamic Education with Ulul Albab Integration Paradigm," *Halaqa: Islamic Education Journal* 8, no. 1 (May 2024): 97–104, https://doi.org/10.21070/halaqa.v8i1.1682.

[7] Moh Hanif Adzhar, Umil Mu'alimatun Muzaroh Fitroroh, and Addin Arsyadana, "The Relevance of Islamic Teaching in Madrasah Diniyah within Semi-Urban Communities," *Intelektual: Jurnal Pendidikan Dan Studi Keislaman* 15, no. 3 (2025): 387–404, https://doi.org/https://doi.org/10.33367/ji.v15i3.7951.

[8] Zainal Abidin Bagir, *Integrasi Ilmu Dan Agama: Interpretasi Dan Aksi* (Mizan Pustaka, 2005), 109.

tradition.[9] Bakar also rejects the secular paradigm that separates science from its spiritual dimension and instead offers a framework that integrates scientific rationality with wisdom derived from revelation.

Osman Bakar asserts that Islamic education should be oriented not only toward the mastery of modern scientific knowledge but also toward instilling ethical and spiritual values across all academic disciplines.[10] Islamic higher education institutions are encouraged to serve as centers of integration between religious studies and the general sciences through a curriculum that unites them in a balanced and complementary manner.[11] Through this approach, it is believed that a generation of Muslim scholars who are academically outstanding, spiritually mature, and morally responsible will emerge. This concept is highly relevant to Indonesia, given that many Islamic educational institutions still maintain a divide between religious and general subjects, resulting in students not receiving a comprehensive learning experience. Bakar's integrative approach has the potential to serve as a framework for transforming Indonesia's Islamic education system toward a more balanced, humanistic, and character-building orientation.

The separation of science and religion in the modern era poses a serious challenge that demands a constructive response from Islamic education. Osman Bakar's ideas offer a clear direction for building an educational system that harmonizes rational thought with the values of faith. Efforts to unify the two serve as a solid foundation for the emergence of a generation that is intellectually resilient and spiritually mature, and, in turn, becomes the cornerstone of a dignified and competitive Islamic civilization amid global dynamics.

Previous studies on the integration of science and religion in Islamic education still contain several gaps, particularly those directly related to Osman Bakar's thought. While earlier studies have addressed issues such as the dichotomy of knowledge, Islamic epistemology, and the integration of knowledge, most have focused solely on theoretical aspects, without elaborating on how these concepts can be operationalized in curricula or higher education practices. Research by Aljunied, for example, focuses more on the philosophical discourse of the renewal of Islamic epistemology but has not specifically linked it to Bakar's ideas, such as the hierarchy of knowledge or the tauhidic approach.[12] Studies by Muna et al. highlight the dichotomy of knowledge but have yet to offer an integrative model grounded in Bakar's intellectual paradigm.[13]

Furthermore, the practical research by Haluti et al. focuses more on educational implementation without linking it to the concept of dual consilience, a hallmark of Bakar's

[9] H. N. Syam, *Integrasi Ilmu Mazhab Indonesia: Studi Interdisipliner, Crossdisipliner, Multidisipliner, Dan Transdisipliner* (Kencana, 2023).
[10] Osman Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam* (Bandung: Pustaka Hidayah, 2008).
[11] Akbarizan, *Integrasi Ilmu Perbandingan UIN Suska Riau Dan Universitas UMMU Al-Quran Mekkah* (Riau: Universitas Islam Negeri Sultan Syarif Kasim, 2014).
[12] "Osman Bakar and Epistemological Renewal in the Muslim World," *Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization (ISTAC)* 27, no. 1 (June 2022): 1–27, https://doi.org/10.31436/shajarah.v27i1.1388.
[13] "Dikotomi Ilmu Agama Dan Umum Dalam Reorientasi Pendidikan Islam," *Jurnal IHSAN Jurnal Pendidikan Islam* 2, no. 3 (October 2024): 1–10, https://doi.org/10.61104/ihsan.v2i3.331.

thought.[14] Other works, such as those by Iis[15], Mansir[16], and Adeoye[17] discuss scientific integration, the Islamization of science, and issues of modernity, but have not made Bakar's thought their primary analytical foundation. This gap in the literature serves as the starting point for this study: an in-depth examination of the integration of science and religion based on Osman Bakar's epistemology within the context of Islamic education in Indonesia.

This study aims to analyze the contribution of Osman Bakar's thought to contemporary Islamic education, with a focus on the application of the concept of Tawhid in the integration of science within the development of Islamic educational science. The findings of this study are expected to serve as a reference in developing a holistic, adaptive, and responsive model of Islamic education that addresses the dynamics and challenges of the modern era.

Tawhid, the Dichotomy of Knowledge, and Osman Bakar's Position among Contemporary Muslim Epistemologists

Tawhid, in its narrowest theological sense, is the confession of God's absolute oneness. Contemporary Muslim philosophers of science, however, treat it as an epistemic principle capable of ordering the relationship between revelation, reason, and empirical inquiry. This extended reading is most visible in Seyyed Hossein Nasr's notion of scientia sacra, or sacred science, which regards authentic knowledge as ultimately rooted in a transcendent, unifying reality rather than in an autonomous, secular rationality.[18] Nasr's framework, situated within the perennialist tradition, holds that the fragmentation of modern knowledge into isolated, value-free disciplines is itself a symptom of the desacralization of the cosmos, and that recovering the sacred quality of knowledge requires restoring its metaphysical foundation. This premise that unity of being entails unity of knowledge forms the conceptual bridge between classical Islamic metaphysics and the epistemological program later advanced by Osman Bakar, whose notion of "tawhidic science" can be read as an extension of this broader discourse rather than an isolated invention.

The second concept requiring clarification is the dichotomy of knowledge, understood as the institutional and epistemological separation between religious sciences and general or secular sciences. Recent scholarship situates the roots of this separation in the encounter between Muslim societies and European colonial education systems, which introduced a bifurcated curricular structure positioning religious knowledge as private and devotional

[14] "Pembelajaran Agama Islam Dan Kearifan Lokal: Strategi Integrasi Budaya Dalam Kurikulum Sekolah Dasar," *Jurnal Pendidikan Islam Al-Ilmi* 7, no. 2 (November 2024): 125–31, https://doi.org/10.32529/al-ilmi.v7i2.3495.

[15] "Integrasi Sains Dan Agama Serta Implikasinya Terhadap Pendidikan Islam," Artikel, *Edukasia Islamika* 1, no. 1 (07 2016): 161–79, https://doi.org/10.28918/jei.v1i1.1130.

[16] "Integration of Islamic Science and Science in Schools: Studies on Learning Islamic Religious Education in the Digital Era," *TADRIS: Jurnal Pendidikan Islam* 17, no. 2 (December 2022): 413–25, https://doi.org/10.19105/tjpi.v17i2.6769.

[17] "Integration of Islamic Thought and Scientific Knowledge in the Formation of Educational Institution Leadership," *TATHO: International Journal of Islamic Thought and Sciences*, April 29, 2025, 141–52, https://doi.org/10.70512/tatho.v2i2.85.

[18] Khairudin Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," *Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization (ISTAC)* 27, no. 1 (June 2022): 1–27, https://doi.org/10.31436/shajarah.v27i1.1388.

while treating scientific knowledge as neutral and value-free.[19] This bifurcation, sustained well into the postcolonial period, has produced what several scholars describe as a persistent identity crisis within Muslim educational institutions: graduates proficient in modern disciplines yet epistemologically disconnected from revelation, or conversely, graduates versed in religious sciences but unequipped to engage constructively with modern knowledge. It is precisely this structural problem that motivated the mid-twentieth-century generation of Muslim thinkers al-Faruqi, al-Attas, Nasr, and later Osman Bakar to formulate distinct, though overlapping, responses.

Positioning Osman Bakar within this landscape requires distinguishing his approach from that of his most immediate interlocutors. Ismail Raji al-Faruqi's Islamization of Knowledge project is primarily curricular and institutional in orientation, proposing a systematic methodology for re-reading modern disciplines through Islamic principles and for reforming university curricula accordingly.[20] Syed Muhammad Naquib al-Attas, by contrast, begins not with curriculum but with the purification of concepts (adab and ta'dib), arguing that the crisis of knowledge is, at its root, a crisis of meaning arising from the corruption of key Islamic terms under Western intellectual influence; his program therefore prioritizes epistemological and linguistic reconstruction prior to any pedagogical application.[21] Comparative studies of these two figures conclude that their approaches are complementary rather than contradictory: al-Faruqi supplies the methodological and institutional architecture, while al-Attas supplies the metaphysical and conceptual depth. Nasr, meanwhile, remains closer to the perennialist and traditionalist school, treating sacred science as continuous across religious traditions rather than as an exclusively Islamic reconstruction project a position that distinguishes him sharply from both al-Faruqi and al-Attas.[22]

Osman Bakar's contribution can be located at the intersection of these three positions, yet it is not reducible to any of them. Like al-Faruqi, Bakar is concerned with the practical translatability of tawhidic principles into scientific and curricular structures; like al-Attas, he insists on a rigorous epistemological foundation prior to institutional reform; and, having been intellectually formed partly under Nasr's supervision, he retains a strong historical and philosophical interest in the classical Islamic scientific tradition as a living resource rather than a merely nostalgic reference. What differentiates Bakar most distinctly, according to recent comparative analysis, is his explicit focus on a narrower and more operational cluster of disciplines mathematics, the natural and cognitive sciences, and engineering which

[19] Abdullah Sahin, "Critical Issues in Islamic Education Studies: Rethinking Islamic and Western Liberal Secular Values of Education," *Religions* 9, no. 11 (October 2018): 335, https://doi.org/10.3390/rel9110335.
[20] Solihah Binti Haji Yahya Zikri, "A Comparative Analysis of The Conceptions of Muhammad Naquib Al-Attas and Ismail Raji Al-Faruqi in Islamization of Knowledge," *Dirosat : Journal of Islamic Studies* 2, no. 1 (November 2017): 17, https://doi.org/10.28944/dirosat.v2i1.41.
[21] Zainuddin Zainuddin et al., "Epistemological Synthesis of Al-Attas and Al-Faruqi: Islamization of Knowledge, Adab, and Contemporary Decolonization of Knowledge," Articles, *ISEDU : Islamic Education Journal* 3, no. 1 (May 2025): 18–31.
[22] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022.

allows his tawhidic epistemology to engage directly with the philosophy and history of science rather than remaining at the level of general metaphysical critique.[23]

Research Methods

This study employs a library research using a qualitative approach as the primary design to examine Osman Bakar's thoughts on the renewal of Islamic education.[24] This design was chosen because it allows the researcher to conduct an in-depth analysis of both the historical context and the substance of a thinker's ideas. The focus of this study on Osman Bakar's intellectual contributions to the integration of Science and religion requires a careful, systematic, and multi-layered reading of his original works; thus, a literature-based approach is the most rational choice for addressing the research questions. Through this design, the researcher can trace the chronological development of Osman Bakar's thought, map out the core arguments in each of his works, and connect his ideas to the broader discourse on contemporary Islamic education.[25] The exploratory and interpretive nature inherent in the qualitative approach allows the researcher to capture the nuances of meaning within the text, not merely describing the content superficially but delving into the philosophical meaning underlying Osman Bakar's concept of "tawhidic science."

The data collection process in this study was conducted through the review and documentation of written sources relevant to the theme of the integration of Science and religion in Osman Bakar's thought. Data sources were grouped into two main categories: primary data and secondary data. Primary data were sourced directly from Osman Bakar's original works, comprising four key books: Tawhid and Science: Islamic Perspectives on Religion and Science,[26] Classification of Knowledge in Islam: A Study in Islamic Philosophies of Science,[27] Tawhid and Science: Essays on the History and Philosophy of Islamic Science,[28] and Islamic Science and the Contemporary World. These four works were selected because they directly present Osman Bakar's key ideas regarding Islamic epistemology, the classification of knowledge, and the relationship between Science and tawhid.

Secondary data were obtained from books, journal articles, conference proceedings, and other academic literature that discuss, analyze, or provide additional context regarding Osman Bakar's thought as well as the issue of Islamic educational reform in general. Data collection was conducted through searches of digital and print sources, the recording of key quotations, and the grouping of themes based on a pre-established conceptual framework,

[23] Komaruddin Sassi, "Principles of Islamic Education Epistemology Tauhid Paradigm (Analysis of Thinking of Naquib Al-Attas)," *International Journal of Elementary Education* 10, no. 3 (2021): 68, https://doi.org/10.11648/j.ijeedu.20211003.14.
[24] Thomas Mann, *The Oxford Guide to Library Research* (Oxford University Press, 2015).
[25] John W. Creswell and Cheryl N. Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 4th ed. (SAGE Publications, 2018).
[26] *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.
[27] *Classification of Knowledge in Islam: A Study in Islamic Philosophies of Science* (Islamic Texts Society, 1998).
[28] *Tawhid and Science: Essays on the History and Philosophy of Islamic Science* (Secretariat for Islamic Philosophy and Science, 1991).

ensuring that all collected documents could be systematically organized to facilitate the subsequent analysis phase.

The collected data were analyzed using content analysis combined with a hermeneutic approach to capture both the textual meaning and the full context of Osman Bakar's thought. Content analysis was used to identify patterns, categories, and central themes that recur in Osman Bakar's works, particularly regarding the concept of the integration of Science and religion. The hermeneutic approach was applied to interpret the text's meaning, taking into account the intellectual background, sociocultural context, and scholarly traditions that shaped Osman Bakar's perspective on Islamic Science.

The analysis process followed three sequential stages, beginning with data reduction, that is, sorting and simplifying information relevant to the research focus, followed by the presentation of data in the form of a systematic descriptive narrative, and concluding with the drawing of conclusions based on the identified patterns of relationships among concepts.[29] To ensure the validity and credibility of the research findings, the researcher employed triangulation in two respects: data source triangulation by comparing information from primary and secondary sources and methodological triangulation by cross-checking the results of content analysis with hermeneutic interpretation.

Results And Discussion

1. Biography of Osman Bakar

Professor Emeritus Datuk Dr. Osman Bakar was born on December 18, 1946, in Bukit Lada, Temerloh, Pahang, Malaysia. His academic journey began at the University of London on a mathematics scholarship, where he earned his Bachelor's degree in 1970. He obtained a Master of Science in Algebra from Bedford College, University of London, before completing his doctoral program at the same institution. His intellectual turning point occurred in October 1981, when he pursued a second doctoral degree at Temple University in Philadelphia in the field of Philosophy of Islamic Science under the guidance of Seyyed Hossein Nasr. The dissertation he produced was later published as Classification of Knowledge in Islam.

Osman Bakar's academic career spanned institutions and continents. He began as a mathematics lecturer at the National University of Malaysia (1970–1977), then moved to the University of Malaya, where he remained until 2000, attaining the rank of full professor in 1992 and serving as Chair of the Department of Philosophy. He served as Vice Chancellor for Academic Affairs and Research at the University of Malaya from 1995 to 2000. Subsequently, he held the Malaysia Chair for Islam in Southeast Asia at Georgetown University in Washington, D.C., until 2005, and then served as a professor at the International Institute of Islamic Thought and Civilization (ISTAC) from 2005 to 2008. His work also extended to the international arena, including service as a member of the Council of 100 Leaders (C-100) and the World Economic Forum in Davos, Switzerland.

[29] Creswell and Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*.

Osman Bakar's intellectual output is remarkable, with over 15 books and 250 articles published by prestigious international publishers, including Oxford University Press and Routledge. His works span a wide spectrum, ranging from the philosophy of science and Islamic epistemology to issues in education, science, and technology. Among his most influential works are The History and Philosophy of Islamic Science,[30] The Hierarchy of Knowledge: Building a Framework for the Islamization of Science, and Islam and the Dialogue of Civilizations. Some of his works have also been translated and published in Indonesia by publishers such as Mizan and Pustaka Hidayah.

Osman Bakar's contributions to the field of Islamic education are reflected in his numerous writings and his participation in international academic forums. His ideas on the role of Islam in higher education policy, while his concept of knowledge integration was developed in his essay "Truth and Wisdom in the Concept of Integrated Knowledge" (1996). His thoughts consistently position Tawhid as the epistemological foundation for building a holistic civilization of knowledge, making him one of the most relevant contemporary Muslim thinkers in the discourse on integrating science and religion.

2. The Concept of Tawhid According to Osman Bakar

Osman Bakar positions tawhid as a metaphysical principle that serves as both the framework and the driving force behind all forms of knowledge. This assertion aligns with the principle of oneness in the first shahada, which serves as the metaphysical foundation that gives rise to and underpins the entire structure of knowledge within the Islamic tradition.[31] The framework of "tawhidic science" developed by Bakar affirms the unity of knowledge through the principle of balance, while simultaneously correcting the misconception that the Muslim scholarly tradition is weak in logic and experimental methods. This idea reinforces the position of Islamic epistemology as a coherent system of thought, in which every branch of knowledge derives its meaning from the awareness of God's oneness as the source of all truth.

Bakar's work, Classification of Knowledge in Islam, serves as a key reference for understanding how Islamic epistemology systematically organizes the hierarchy and categories of knowledge. This in-depth discussion of epistemological principles and the categorization of knowledge demonstrates that the Islamic scientific tradition possesses a distinctive classificatory framework, distinct from the dichotomous division between the sciences and the humanities in the Western tradition.[32] The concept of tawhidic epistemology is relevant when confronting modern challenges, as emphasized in his vision of a new synthesis between Islamic science, modern science, and postmodern conditions through the principle of tawhid as the primary intellectual instrument.[33]

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[30] *Tawhid and Science: Essays on the History and Philosophy of Islamic Science*.

[31] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022; Osman Bakar, "The Qur'anic Identity of the Muslim Ummah: Tawhidic Epistemology as Its Foundation and Sustainer," *ICR Journal* 3, no. 3 (April 2012): 438–54, https://doi.org/10.52282/icr.v3i3.531.

[32] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022.

[33] Osman Bakar, "Islamic Science, Modern Science, and Post-Modernity Towards a New Synthesis Through a Tawhidic Epistemology," *Revelation and Science* 1, no. 03 (December 2011), https://doi.org/10.31436/revival.v1i03.36.

Philosophical studies on the epistemological foundations of natural science in Islam affirm that the framework of tawhid provides an ontological foundation for understanding the universe as a creation imbued with spiritual meaning.[34] This view aligns with Bakar's emphasis that knowledge of natural phenomena is always linked to religious consciousness, so that scientific activity in Islam is never detached from its inherent spiritual dimension. It is this synthesis between the metaphysical and empirical dimensions that characterizes Osman Bakar's tauhid-based thought in contemporary Islamic epistemology.

Tawhid occupies a central position in the structure of Islamic teachings. Substantively, Tawhid is the acknowledgment of the Oneness of Allah SWT, encompassing the dimensions of essence, attributes, actions, and the relationship between God and His servants.[35] All of a Muslim's acts of worship and supplications are centered on this principle, for Tawhid affirms that nothing is equal to or comparable with Allah SWT. From Osman Bakar's perspective, Tawhid is not merely a self-contained theological dogma but is closely intertwined with epistemological orientation and the spirit of scholarship within the Islamic tradition.

Osman Bakar asserts that Tawhid is an inseparable component of the scientific spirit of seeking knowledge, or, more specifically, is directly related to science. Science in the Arabic tradition is referred to as 'Ulum, which refers to the entirety of scientific disciplines within the Islamic tradition. However, Osman Bakar limits the scope of the scientific disciplines he discusses to Mathematics, Natural and Cognitive Sciences (including Psychology and Medicine), and Engineering Sciences. This limitation reflects his measured and systematic methodological orientation in establishing the relationship between Tawhid and science.

Before the relationship between Tawhid and science can be fully understood, the structure of both must first be examined. The structure of Islam, as articulated in the Prophet's hadith, rests on three main pillars: Islam, iman, and ihsan. Islam refers to the manifestation of a servant's submission and obedience in the practical realm. Iman refers to the totality of knowledge and belief about the reality of God, the universe, and humanity, encapsulated in the six pillars of faith. Ihsan represents the pinnacle of a Muslim's spiritual experience, the full practice of Islam and the complete demonstration of faith, or the comprehensive implementation of Islam. These three pillars are intertwined, forming a comprehensive religious structure.

According to Muslim philosophers of science, the structure of science consists of four essential components. The first component is the object of study or subject matter, systematically designed to encompass a body of knowledge comprising concepts, principles, realities, and the logical relationships among them. The second component comprises the initial premises and hypotheses that form the foundation of scientific knowledge, and the ontological nature of these premises must align with the fundamental assumptions of the relevant science. The third component concerns the methods

[34] Marziyehsadat Montazeritabar, "Epistemological Foundations of Natural Sciences in Islam," *Open Journal of Philosophy* 09, no. 02 (2019): 63–71, https://doi.org/10.4236/ojpp.2019.92006.
[35] Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.

employed in the study of a scientific discipline, including data collection procedures, analysis, theory formation, and the verification of truth claims against hypotheses and scientific laws. The fourth component concerns the goals and aspirations underpinning the very existence of science itself, namely, the acquisition of knowledge about reality that aligns with scientific certainty and conviction. According to Osman Bakar, the principle of tauhid is all-encompassing, revealing the interconnectedness of all within a single reality. This means that every branch of knowledge ultimately guides one toward a single truth: the belief in the Oneness of Allah SWT. Within this framework, Tawhid serves as an epistemological axis, unifying all scholarly activities under a single divine paradigm.

Osman Bakar develops his concept of Tawhid into twelve interrelated topics, namely: (1) religious consciousness and scientific spirit in the Islamic tradition; (2) methodological issues in Islamic science; (3) the place of doubt in Islamic epistemology through the philosophical experience of Al-Ghazali; (4) the unity of science and spiritual knowledge in the Islamic experience; (5) the atomistic conception of the universe in Ash'ari theology; (6) an introduction to the philosophy of Islamic medicine; (7) the influence of Islamic science on medieval Christian conceptions of the universe; (8) Omar Khayyam's critique of Euclid's parallel postulate; (9) Islam and bioethics; (10) Muslim intellectual responses to modern science; (11) Islam, science, and technology from historical and prospective perspectives; and (12) applied sciences and engineering from the perspectives of Tawhid and sharia. These twelve topics form a cohesive intellectual framework in which science and spirituality mutually reinforce one another.

Osman Bakar's concept of Tawhid bears similarities to the project of the Islamization of science championed by Ismail Raji al-Faruqi; however, the distinction between the two lies in the scope of scientific disciplines chosen as subjects of study. Osman Bakar selectively focuses his discussion on Mathematics, Natural and Cognitive Sciences, Psychology, Medicine, and Engineering Sciences, making his argumentation more focused and operational.

The implications of Osman Bakar's concept of tauhid for the contemporary context are highly significant. Muslim generations facing the rapid tide of technological development require a solid foundation in tauhid, alongside a scientific spirit integrated with belief in the Oneness of Allah SWT. The internalization of tauhid values must be instilled from an early age through the family environment, educational institutions, and social communities, thereby fostering the ability to filter information and technology through a tauhidic lens critically. Technology that has the potential to bring benefits and remains within the bounds of Allah SWT's pleasure should be optimized for use. In contrast, that which distances humanity from divine values and brings harm should be abandoned.[36]

[36] Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.

3. Tawhid as the Foundation for the Integration of Knowledge

The discourse on the Islamization of knowledge emerged as an intellectual response to the concerns of several Muslim thinkers regarding the stagnation of Islamic scholarship in the face of the advances of modern Western science. It was this concern over the Muslim community's lag in the mastery of knowledge that prompted figures such as Sayyid Hossein Nasr, Fazlur Rahman, Ismail Raji al-Faruqi, and Syed Muhammad Naquib al-Attas to formulate various epistemological solutions.[37] Al-Faruqi emphasized the importance of integrating modern knowledge with the values of tawhid through a systematic process of Islamization. At the same time, al-Attas placed greater emphasis on the concept of adab and the purification of knowledge from elements of Western secularism. The differing emphases between these two figures provide an important intellectual context for understanding Osman Bakar's distinctive position within the same discourse.

Al-Attas's contribution to Islamic education is underscored by his conception of adab as the foundation for the formation of a well-rounded individual, both intellectually and morally, which has direct implications for the development of a curriculum grounded in spiritual values.[38] Al-Faruqi, for his part, made a significant contribution to the Islamization of knowledge through a methodological framework that seeks to integrate the epistemology of revelation with modern rational epistemology.[39] Osman Bakar enriches this discourse by synthesizing perspectives from the perennialist tradition and the movement for the Islamization of science, forming a model that can be practically applied in contemporary scientific practice without compromising the authenticity of Islamic values. The uniqueness of Bakar's approach lies in his ability to bridge the tradition of classical Islamic philosophy of science with the epistemological demands of the modern era.

Recent studies on the epistemological synthesis between al-Attas and al-Faruqi further affirm that the movement for the Islamization of science possesses a dimension of decolonization of knowledge that remains relevant to this day. Research on the epistemological synthesis of these two figures demonstrates how the Islamization of science, the concept of adab, and the decolonization of contemporary knowledge are interrelated within a single framework of Islamic intellectual renewal.[40] Osman Bakar's position within this intellectual landscape can be understood as both a complement to and an expansion of his predecessors' ideas, particularly through his emphasis on the

[37] Ahmad Nabil Amir and Tasnim Abdul Rahman, "Education in the Al-Faruqi's Perspective and Its Implementation in the Context of the Islamization of Knowledge," *Southeast Asian Journal of Islamic Education* 5, no. 1 (2022): 65–80, https://doi.org/https://doi.org/10.21093/sajie.v4i2.5475.

[38] Rahmad Yulianto and Achmad Baihaki, "Islamisasi Ilmu Pengetahuan Dalam Perspektif Syed Muhammad Naquib Al-Attas," *Al-Hikmah: Jurnal Studi Agama-Agama* 4, no. 1 (January 2019), https://doi.org/10.30651/ah.v4i1.2335.

[39] Muhammad Syafrani Permadi et al., "Quo Vadis The Integrating Islam and Science, A Comparative Study of the Thoughts of Al Faruqi, Al Attas, and Amin Abdullah: Quo Vadis Integrasi Islam Dan Sains, Telaah Komparatif Pemikiran Al Faruqi, Al Attas, Dan Amin Abdullah," Articles, *Halaqa: Islamic Education Journal* 9, no. 2 (November 2025): 78–89, https://doi.org/10.21070/halaqa.v9i2.1775.

[40] Candra Darmawan, "Decolonizing Malay-Islamic Epistemology: Revitalizing the Intellectual Tradition in the Nusantara through a Philosophy of Science Perspective," Articles, *Fikri : Jurnal Kajian Agama, Sosial Dan Budaya* 9, no. 2 (December 2024): 499–512, https://doi.org/10.25217/jf.v9i2.7056.

philosophical and historical dimensions of Islamic science, aspects that neither al-Faruqi nor al-Attas had explored in depth. It is this distinctiveness that makes Bakar's thought worthy of separate examination within the context of contemporary Islamic educational renewal.

Efforts to renew Islamic education cannot be separated from the problem of the dichotomy of knowledge, which has long divided the Muslim community's educational system into two distinct poles religious knowledge and general knowledge a division regarded by several scholars as one of the principal causes of the Muslim community's decline in science and technology. [41] Osman Bakar's response to this dichotomy becomes clearer when situated alongside his immediate predecessors in the Islamization-of-knowledge discourse. Al-Faruqi's project is primarily curricular and institutional, proposing a systematic methodology for re-reading modern disciplines through Islamic principles. Al-Attas, by contrast, begins with the purification of concepts adab and ta'dib treating the crisis of knowledge as, at root, a crisis of meaning that must be resolved epistemologically and linguistically before any curricular reform is attempted.[42]

Nasr, under whom Bakar completed his second doctorate, remains closer to the perennialist tradition, treating sacred science as continuous across religious traditions rather than as an exclusively Islamic reconstruction project.[43] Bakar's tawhidic epistemology occupies a distinctive position among these three: it shares al-Faruqi's concern for curricular translatability, al-Attas's insistence on epistemological rigor prior to reform, and Nasr's historical-philosophical engagement with the classical scientific tradition while adding a dimension none of the three developed in comparable depth, namely a structural, discipline-specific account of how the exact and natural sciences are internally organized under tawhid.[44]

This structural account rests on two interlocking concepts. The first is the hierarchy of knowledge, in which knowledge derived from revelation, the Qur'an and Hadith is positioned as the primary foundation that supplies direction, meaning, and moral orientation for the empirical sciences, ensuring that modern science does not operate on materialistic logic alone but remains oriented toward the maqasid al-Shari'ah.[45] The second is dual consilience, Bakar's methodological instrument for integration, operating on two levels simultaneously: the unification of the various branches of knowledge at the level of method, and the internalization of divine values into scientific products at the level of purpose.[46] Together, these two concepts transform tawhid from a general metaphysical affirmation into an operational epistemological architecture one in which curriculum transformation becomes a logical requirement rather than an optional add-

[41] Fernadi, "Discourse of Contemporary Islamic Education."
[42] Haji Yahya Zikri, "A Comparative Analysis of The Conceptions of Muhammad Naquib Al-Attas and Ismail Raji Al-Faruqi in Islamization of Knowledge."
[43] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022.
[44] Adeoye and Baharun, "Integration of Islamic Thought and Scientific Knowledge in the Formation of Educational Institution Leadership."
[45] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022.
[46] Bakar, "Islamic Science, Modern Science, and Post-Modernity Towards a New Synthesis Through a Tawhidic Epistemology."

on, since teaching general sciences and Islamic studies as separate compartments contradicts the very structure of knowledge that dual consilience describes.

Bakar's intellectual contribution lies in developing an epistemological framework that unites modern science with Islamic values and offers a constructive response to the challenges posed by secularism, which has severed the connection between science and spirituality.[47] Modern science, which has developed without considering spiritual and ethical dimensions, is seen as needing to be reconstructed on the principle of Tawhid. Bakar asserts that Tawhid is the primary foundation of all forms of knowledge in Islam and the key to restoring harmony between science, morality, and spirituality.[48] The universe, in Bakar's perspective, is an open text revealing various signs of God's greatness. Studying the natural sciences is therefore not merely an intellectual activity but simultaneously an expression of worship. This idea is elaborated in depth in his work Tawhid and Science: Essays on the History and Philosophy of Islamic Science, where the separation between religious and secular knowledge is asserted to be a mere historical deviation rather than an epistemological necessity within the Islamic tradition.[49]

To operationalize this concept of integration in practice, Bakar proposes a hierarchical structure of knowledge. Knowledge derived from revelation, namely the Qur'anic and Hadith-based is positioned as the primary foundation that provides direction, meaning, and moral orientation for the development of the empirical sciences. This hierarchy, which he discusses in Classification of Knowledge in Islam: A Study in Islamic Philosophies of Science, ensures that modern science does not operate solely on materialistic logic but is also oriented toward ethical and spiritual goals in accordance with the maqasid al-Shari'ah.[50] With this conceptual architecture established, the next section turns from theory to practice, examining how the hierarchy of knowledge and dual consilience translate into concrete implications for curriculum design, pedagogy, and assessment in Islamic education.

4. The Implications of Osman Bakar's Tawhid Thought for the Development of Islamic Education

Tawhid in Osman Bakar's conceptual framework is multidimensional and permeates various fields of knowledge. According to him, every branch of knowledge, ultimately, guides a person toward acknowledging the Oneness of the Creator. The tauhidic belief ingrained within an individual also shapes their mindset, behavioral orientation, and actions as they navigate life, including in scholarly activities.[51] From this framework of thought, several significant implications for the field of education can be identified:

[47] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022.
[48] Mahmudi Mahmudi, Sri Sumarni, and Fahruddin Faiz, "Integration of Science and Religion: Implications for Islamic Education," *QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama* 14, no. 1 (June 2022): 303–16, https://doi.org/10.37680/qalamuna.v14i1.4102.
[49] Eric Winkel, "Tawhid and Science: Essays on the History and Philosophy of Islamic Science," *The Muslim World* 83, nos. 3–4 (October 1993): 329–35, https://doi.org/10.1111/j.1478-1913.1993.tb03584.x.
[50] Bakar, *Classification of Knowledge in Islam: A Study in Islamic Philosophies of Science*.
[51] Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.

First, faith in the Oneness of Allah carries the epistemological implication that the universe was not created in vain, driving learners to explore natural phenomena from both scientific and spiritual perspectives simultaneously.[52] This implication can be operationalized as a three-stage lesson structure embeddable into existing science curricula (e.g., IPA/Fisika in madrasah or pesantren) without requiring an entirely new subject: (1) Empirical Observation, students investigate a natural phenomenon (e.g., flooding, the water cycle, or avian flight) using standard scientific method and terminology; (2) Textual Correlation, the teacher introduces the relevant Qur'anic or Hadith reference addressing the same phenomenon (e.g., Q.S. Al-Mulk: 19 on flight; verses on the water cycle for floods); (3) Reflective Synthesis, students complete a structured worksheet articulating how the empirical and textual explanations describe the same reality from complementary vantage points, rather than competing accounts. This structure keeps the science curriculum's technical content intact while adding a low-cost, replicable integrative layer.

Second, the concept of tauhid guides educators and students in developing comprehensive thinking skills for analyzing various issues. Understanding a phenomenon is insufficient if it relies solely on a single perspective. For instance, a bird's ability to fly without falling can be explained through aerodynamic principles and is also linked to Allah SWT's revelation in Surah Al-Mulk, verse 19, which invites humanity to reflect on how birds remain in the air as evidence of His power. The integration of scientific and Qur'anic perspectives yields a more holistic, profound, and meaningful understanding.[53]

Third, the historical record of Islamic civilization during its golden age, when Muslim scholars made monumental contributions across various scientific disciplines, serves as a source of motivation that never loses its relevance. Awareness of this intellectual heritage sparks the intellectual spirit of contemporary Muslims, inspiring them to continue innovating and creating. The revival of Islamic civilization is viewed not as an impossibility, but as an inevitability that can be achieved through scientific productivity grounded in Tawhid.

Fourth, the goals of education enlightening the nation, optimizing human potential, and cultivating noble character are substantively connected to the principle of tawhid, since the cognitive faculties themselves are understood as instruments for recognizing God's signs in creation.[54] Operational example Tawhidic Competency Assessment Rubric. To make this implication measurable rather than aspirational, learning outcomes can be assessed along three weighted dimensions rather than cognitive mastery alone: (a) Scientific-Cognitive Understanding (accuracy of empirical/technical explanation, 40%); (b) Textual-Spiritual Correlation (ability to identify and explain the relevant revelatory reference, 30%); (c) Reflective Synthesis (quality of the learner's own articulation of how the two dimensions relate, 30%). Such a rubric operationalizes the

[52] Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.
[53] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022; Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.
[54] Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*.

"intellectually competent and religiously mature" learner profile that tawhidic education aims to produce, giving instructors a concrete instrument rather than a normative description alone.

Fifth, educational institutions bear the institutional responsibility of designing curricula that realize holistic, tawhid-integrated education rather than treating religious and scientific content as separate compartments.[55] This implication can be illustrated through a proposed 14-week elective, "Tawhidic Science Literacy," structured around dual consilience: Weeks 1–3 introduce the hierarchy of knowledge and the historical roots of the dichotomy of knowledge; Weeks 4–9 pair core scientific topics (e.g., cosmology, biological classification, the water cycle) with their corresponding Qur'anic and Hadith correlates, following the three-stage teaching strategy above; Weeks 10–12 involve student-led case studies applying dual consilience to a discipline of their choice; Weeks 13–14 involve a capstone project assessed using the rubric above. Such a syllabus could be piloted as a single elective course before broader curricular integration is attempted, offering institutions a low-risk entry point for implementation.

Sixth, the tauhid paradigm encourages educators to remain open to the latest developments in knowledge, without neglecting the body of knowledge that has been established previously. Students, on the other hand, are required to develop intellectual creativity, access contemporary knowledge, and consider the classical scholarly heritage as material for comparison and collaboration aligned with Sharia principles.[56] It is this openness and wisdom in responding to the currents of change that distinguishes Muslim intellectuals with a monotheistic paradigm from those who merely follow the currents of modernity.[57]

Seventh, a learning environment designed comprehensively and integrally has the potential to produce philosophers, scientists, intellectuals, and technologists capable of generating innovative scientific and technological discoveries.[58] Such a learning ecosystem is not merely an arena for the transfer of knowledge but a space for the cultivation of civilization that connects the breadth of knowledge with the depth of faith. This is the vision of Islamic education envisioned by Osman Bakar: a system that produces well-rounded human beings who excel intellectually while remaining steadfast in spirituality.

[55] Aljunied, "Osman Bakar and Epistemological Renewal in the Muslim World," June 2022; Bakar, *Tawhid and Science: Essays on the History and Philosophy of Islamic Science*; Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*; Bakar, "Islamic Science, Modern Science, and Post-Modernity Towards a New Synthesis Through a Tawhidic Epistemology."
[56] Bakar, *Tawhid and Science: Essays on the History and Philosophy of Islamic Science*; Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*; Bakar, "Islamic Science, Modern Science, and Post-Modernity Towards a New Synthesis Through a Tawhidic Epistemology."
[57] Adzhar, Fitroroh, and Arsyadana, "The Relevance of Islamic Teaching in Madrasah Diniyah within Semi-Urban Communities."
[58] Bakar, *Tawhid and Science: Essays on the History and Philosophy of Islamic Science*; Bakar, *Tauhid Dan Sains: Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam*; Bakar, "Islamic Science, Modern Science, and Post-Modernity Towards a New Synthesis Through a Tawhidic Epistemology."

Conclusion

This study finds that tawhid, within Osman Bakar's conceptual framework, functions not merely as a theological doctrine but as a complete and operational epistemological system directly addressing the first research question posed in this study. In response to the second research question, this study finds that Bakar's mathematical and philosophy of science background produced a structural, discipline-specific account of knowledge integration articulated through the hierarchy of knowledge and dual consilience that distinguishes his epistemology from al-Faruqi's curricular-institutional approach, al-Attas's concept-purification approach, and Nasr's perennialist approach. In response to the third research question, this study finds that dual consilience is not a utopian abstraction but a methodological framework directly translatable into curriculum design, teaching strategy, and assessment practice, as demonstrated through the operational models proposed in the preceding section. Taken together, these findings indicate that tawhid in the discourse of Islamic education has more often been treated as normative content than as an epistemological foundation with structural implications for the architecture of scholarship and the educational system as a whole a gap this study addresses directly.

From an academic perspective, this study contributes a perspective that complements and expands upon previous findings on Islamic epistemology. It addresses gaps in the existing literature by offering an integrative model grounded in Osman Bakar's tawhidic epistemology, in which revelation functions as the foundation of knowledge and dual consilience as the methodological instrument for its integration. This contribution extends beyond confirming previous findings by proposing the hierarchy of tawhidic knowledge as a new analytical framework for the development of contemporary Islamic educational scholarship.

These findings carry practical implications for Islamic education policy in Indonesia. For the Ministry of Religious Affairs (Kementerian Agama), the hierarchy of knowledge and dual consilience offer a conceptual basis for reviewing curriculum frameworks in madrasah and Islamic higher education institutions (PTKI), particularly in strengthening the integration of general and religious sciences beyond superficial curricular juxtaposition. For pesantren and madrasah administrators, the operational models proposed in this study the integrated reflection teaching strategy, the tawhidic competency assessment rubric, and the sample elective syllabus provide a low-risk, incremental entry point for piloting tawhid-based science integration without requiring wholesale curriculum restructuring. For Islamic higher education institutions (PTKI), Bakar's emphasis on the internal logic of the exact sciences suggests the value of recruiting and training educators with genuine technical competence in the natural and mathematical sciences alongside Islamic studies, rather than relying solely on religious studies faculty to deliver integrative content. These implications, however, remain conceptual proposals pending empirical validation in actual institutional settings, as noted in the limitations below.

This study has several limitations, including its focus on a single thinker, Osman Bakar, which does not accommodate a comparative perspective with other contemporary Muslim thinkers in equal depth. Its data sources are also limited to written works within a specific timeframe, without direct empirical observation of the implementation of Bakar's

ideas in Islamic educational institutions. Further research incorporating case studies across various levels of education, a more diverse sample of institutions, and a mixed-methods approach combining literature review with field research is needed to test the operational models proposed here and to achieve a deeper, more comprehensive understanding. Expanding such research will ultimately support the development of more targeted, adaptive, and epistemologically grounded Islamic education curriculum policies.

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