

ECOLOGICAL LITERACY IN ISLAMIC EDUCATION: Strengthening Environmental Awareness Through Tauhid-Based Learning

Taufikin¹, YUSDANI²

¹IAIN Kudus

Jl. Conge Ngembalrejo Bae, Kudus, Jawa Tengah, Indonesia

²PHIPD FIAI UII Yogyakarta

Jl. Kaliurang km. 14,5 Sleman, Yogyakarta 55584, Indonesia

E-mail: ¹taufikin@iainkudus.ac.id, ²yusdani@uii.ac.id

Received: 23-03-2025; Revised: 05-04-2025; Accepted: 07-06-2025; Published regularly: June 2025

Abstract: Environmental education is key in promoting environmental literacy, but integrating religious principles in education for sustainability remains under-researched. This study examines the role of tauhid-based environmental literacy in Islamic education, focusing on its effectiveness in shaping students' environmental awareness. The study used a qualitative approach involving interviews, observations and document analysis in three Islamic primary schools known for their commitment to the environment. The results showed that integrating Islamic theological teachings with environmental literacy significantly increased students' awareness and responsibility towards the environment. The main mechanisms are theological teaching, experiential learning, and institutional support, strengthening sustainability practices together. However, challenges such as the lack of a structured curriculum, resources, and inconsistent institutional support hinder the full implementation of faith-based environmental education. Compared to secular models, tauhid-centered sustainability education offers a holistic approach that integrates ethical, spiritual and scientific aspects and promotes long-term behavioral change. This research contributes to the broader debate on faith-based environmental education by providing empirical evidence on the effectiveness of religion-integrated sustainability education. Future research should explore curriculum development and policy integration to institutionalize tauhid-based environmental literacy, ensuring its long-term impact in different educational contexts.

Keywords: faith-based sustainable development; environmental education; environmental literacy; tauhid-centered learning

Abstrak: Pendidikan lingkungan memiliki peran krusial dalam menumbuhkan kesadaran ekologi, namun integrasi prinsip berbasis agama dalam pembelajaran keberlanjutan masih kurang dieksplorasi. Studi ini menelaah peran literasi ekologi berbasis tauhid dalam pendidikan Islam, dengan fokus pada efektivitasnya dalam membentuk kesadaran lingkungan siswa. Penelitian ini menggunakan pendekatan kualitatif dengan metode wawancara, observasi, dan analisis dokumen di tiga sekolah dasar Islam yang diakui atas komitmennya terhadap lingkungan. Hasil penelitian menunjukkan bahwa integrasi ajaran teologi Islam dengan literasi ekologi secara signifikan meningkatkan kesadaran dan tanggung jawab lingkungan siswa. Mekanisme utama yang mendukung hal ini mencakup pengajaran teologis, pembelajaran berbasis pengalaman, dan dukungan institusional yang secara kolektif memperkuat praktik keberlanjutan. Namun, tantangan seperti kurangnya kurikulum yang terstruktur, keterbatasan sumber daya, dan dukungan institusional yang tidak konsisten masih menghambat implementasi penuh pendidikan ekologi berbasis agama. Dibandingkan dengan model sekuler, pendidikan keberlanjutan berbasis tauhid menawarkan pendekatan holistik yang menggabungkan dimensi etika, spiritual, dan ilmiah, serta mendorong perubahan perilaku jangka panjang. Studi ini berkontribusi pada diskursus lebih luas mengenai pendidikan lingkungan berbasis agama dengan memberikan bukti empiris tentang efektivitas pembelajaran keberlanjutan yang terintegrasi dengan nilai-nilai keagamaan. Penelitian selanjutnya perlu mengeksplorasi pengembangan kurikulum dan integrasi kebijakan untuk menginstitusionalisasikan literasi ekologi berbasis tauhid, guna memastikan dampak jangka panjang dalam berbagai konteks pendidikan.

Kata kunci: keberlanjutan berbasis agama; pendidikan lingkungan; literasi ekologi; pembelajaran berbasis tauhid

Introduction

Environmental degradation has become an increasingly alarming problem in recent decades: deforestation, pollution, and unsustainable exploitation of natural resources have reached critical levels.¹ Various efforts have been made, such as green policies, environmental education, and sustainable development programs. However, these initiatives often have limited effectiveness due to the lack of integration of environmental awareness into the education system². Tauhid is a fundamental approach to promoting environmental awareness in Islamic education by integrating Islamic spiritual and ethical values.³

Environmental literacy in Islamic education has been introduced through various methods, such as environment-based curriculum, *fiqh* (Islamic jurisprudence) on environmental ethics, and sustainability practices in *pesantren*.⁴ However, in-

depth research on integrating tauhid as a central element in forming environmental awareness is still limited. This research aims to fill this gap by exploring how tauhid-based learning can enhance environmental literacy in Islamic education.

The main research problems: (1) What is the concept of environmental literacy from an Islamic perspective? (2) How can tauhid-based education improve environmental literacy? (3) What is the role of Islamic education in overcoming the global environmental crisis?

This research contributes by developing a pedagogical approach based on tauhid to improve environmental literacy in Islamic education. The results of this study are hoped to help develop a more holistic environmental education policy based on spiritual values.

Previous research defines environmental literacy as understanding, interpreting and applying environmental principles in everyday life.⁵ In Islamic education, environmental literacy is in line with the concepts of tauhid, *khalifah fil ardh* (stewardship).⁶ Tauhid instills a transcendent relationship between humans and nature as part of God's creation, while the concept of *Khalifah* emphasizes human responsibility to maintain ecological balance.⁷

¹ Johan Rockström et al., "A Safe Operating Space for Humanity," *Nature* 461, no. 7263 (September 2009): 472–75, <https://doi.org/10.1038/461472a>; B.V. Osuntuyi and H.H. Lean, "Economic Growth, Energy Consumption and Environmental Degradation Nexus in Heterogeneous Countries: Does Education Matter?," *Environmental Sciences Europe* 34, no. 1 (2022), <https://doi.org/10.1186/s12302-022-00624-0>; M. Zachariou, A.H. Adenuga, and C. Jack, "Education and Farmers' Environmental Performance: A Systematic Literature Review," *Sustainability (Switzerland)* 17, no. 2 (2025), <https://doi.org/10.3390/su17020796>; I. Vieira, P. Duarte, and P. Carvalho, "ENVIRONMENTAL EDUCATION IN RETROSPECT: GENESIS AND DEVELOPMENT OF AN EDUCATIONAL MOVEMENT," *E-Revista de Estudos Interculturais* 2023, no. 11 (2023); D.J. Frank, K.J. Robinson, and J. Olesen, "The Global Expansion of Environmental Education in Universities," *Comparative Education Review* 55, no. 4 (2011): 546–73, <https://doi.org/10.1086/661253>.

² Stephen R. Sterling, *Sustainable Education: Re-Visioning Learning and Change* (Totnes: Green Books for the Schumacher Society, 2001), <http://archive.org/details/sustainableeduca000oster>.

³ Seyyed Hossein Nasr, *The Heart of Islam: Enduring Values for Humanity* ([San Francisco, Calif.]: HarperSanFrancisco, 2002), <http://archive.org/details/heartofislamendu0000nasr>.

⁴ R. BR, "Teachers' Belief and Practice in Environmental Education: Evidence from an Indonesian Islamic Primary School," *Education* 3-13, 2024, <https://doi.org/10.1080/03004279.2024.2351553>; Nur Wakhidah and Erman Erman, "Examining Environmental Education Content on Indonesian Islamic Religious Curriculum and Its Implementation in Life," *Cogent Education* 9, no. 1 (December 31, 2022): 2034244, <https://doi.org/10.1080/2331186X.2022.2034244>; I. Farida et al., "Project-Based Teaching and Learning Design for Internalization of Environmental Literacy with Islamic Values," *Jurnal Pendidikan IPA Indonesia* 6, no. 2 (2017): 277–84, <https://doi.org/10.1080/15457315.2017.1381186>.

⁵ David W. Orr, *Ecological Literacy: Education and the Transition to a Postmodern World* (Albany: State University of New York Press, 1992), <http://archive.org/details/ecologicallitera0000orrrd>.

⁶ Seyyed Hossein Nasr, *Religion & The Order of Nature* (New York: Oxford University Press, 1996), [http://archive.org/details/religionorderofnooseyy; Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives," *Religions* 11, no. 8 \(2020\): 1–17, <https://doi.org/10.3390/rel11080394>.](http://archive.org/details/religionorderofnooseyy; Rahman, Zabidi, and Halim,)

⁷ Rahman et al., "SOCIO-ECO-RELIGIO-CULTURAL APPROACHES IN ADDRESSING ENVIRONMENTAL DAMAGE: AN INTERPRETATIVE ANALYSIS BASED ON THE QURAN AND HADITH," *Revista de Gestao Social e Ambiental* 18, no. 1 (2024), <https://doi.org/10.24857/RGSA.V18N1-127>; A.H. Ansari, P. Jamal, and U.A. Oseni, "Sustainable Development: Islamic Dimension with Special Reference to Conservation of the Environment," *Advances in Natural and Applied Sciences* 6, no. 5 SPL.ISS. 4 (2012): 607–19; H. Masoumbeigi et al., "An Approach to the Anthropological Theory of the Qur'an and Hadith and Their Roles

Several studies have investigated Islamic approaches to environmental education. Wakhidah highlighted the importance of an integrated Islamic curriculum in developing environmental awareness.⁸ Similarly, Ansari, Moneim and Rini showed that sustainable development practices based on Islamic values in *pesantren* serve as an effective model for environmental education.⁹ However, pedagogical practices incorporating tauhid have received less attention in environmental literacy research.

To address this gap, this study summarizes relevant literature closely related to the tauhid-based approach to environmental education. Integrating tauhid into environmental literacy is positioned as a distinct paradigm that differentiates this study from previous research and ultimately identifies existing research gaps. Although several studies have explored faith-based environmental education, few have systematically examined how a tauhid-centered learning structure can shape students' environmental literacy in an Islamic educational setting.

This study aims to examine tauhid's role in environmental literacy, establish its novelty in environmental education discourse and strengthen the research hypothesis that tauhid-based learning contributes to deepening environmental awareness. This research examines the theoretical underpinnings of Islamic environmental literacy and analyzes the pedagogical approach integrated with tauhid and its implications for sustainability education in Islamic educational institutions. By addressing these objectives, this research contributes to the

broader academic discourse on religious perspectives on environmental literacy and provides a new framework for sustainability education based on Islamic teachings.

Method

This study uses a qualitative approach to explore integrating tauhid-based learning in developing environmental literacy in Islamic education.¹⁰ The research was conducted in three elementary schools in Demak District, Indonesia: MIN 4, SD Negeri Batusari 5, and SD Negeri Batusari 6. These schools were selected based on their achievements as National Adiwiyata Schools (Decree of the Minister of Environment and Forestry No. 6721, April 30, 2024), demonstrating a strong commitment to environmental education. This research aims to understand how these schools integrate Islamic theological principles into their sustainability education framework.

The study involved 35 students, 15 teachers, and three headmasters actively implementing the ecotechnology program. The participants were purposively selected to ensure the representation of people directly involved in pedagogical processes involving Tauhid and environmental ethics.

To gain a comprehensive understanding of how tauhid-based environmental literacy is integrated into Islamic education, this study used three main data collection methods: semi-structured interview, observations, and documentary analysis.¹¹

The collected data was analyzed using thematic analysis and an inductive approach to identify

in Reducing Environmental Degradation," *International Journal of Medical Toxicology and Forensic Medicine* 11, no. 4 (2021), <https://doi.org/10.32598/ijmtfm.v11i4.36166>.

⁸ BR, "Teachers' Belief and Practice in Environmental Education"; Wakhidah and Erman, "Examining Environmental Education Content on Indonesian Islamic Religious Curriculum and Its Implementation in Life"; Wakhidah and Erman.

⁹ Ansari, Jamal, and Oseni, "Sustainable Development"; Y.A. Moneim, "The Green Islamic Approach on Environmental Sustainability: A Contemporary Perspective," *Manchester Journal of Transnational Islamic Law and Practice* 19, no. 2 (2023): 43–68; D.K. Rini et al., "Sustainability Indicators of Ecological Philosophy (Ecosophy) Based on the Agroecology Islamic Boarding School," *International Journal of Interdisciplinary Educational Studies* 18, no. 1 (2023): 13–34, <https://doi.org/10.18848/2327-011X/CGP/v18i01/13-34>.

¹⁰ Robert Bogdan, *Qualitative Research for Education: An Introduction to Theory and Methods* (Boston: Allyn and Bacon, 1998), http://archive.org/details/qualitative_research_bogdan; Carlos Antonio Viera, "CASE STUDY AS A QUALITATIVE RESEARCH METHODOLOGY," *Performance Improvement Journal* 62, no. 4 (March 13, 2024): 125–29, <https://doi.org/10.56811/PFI-23-0005>.

¹¹ E. Knott et al., "Interviews in the Social Sciences," *Nature Reviews Methods Primers* 2, no. 1 (2022), <https://doi.org/10.1038/s43586-022-00150-6>; John W. Creswell and Cheryl N. Poth, "Qualitative Inquiry and Research Design," SAGE Publications Inc, 2018, <https://us.sagepub.com/en-us/nam/qualitative-inquiry-and-research-design/book266033>.

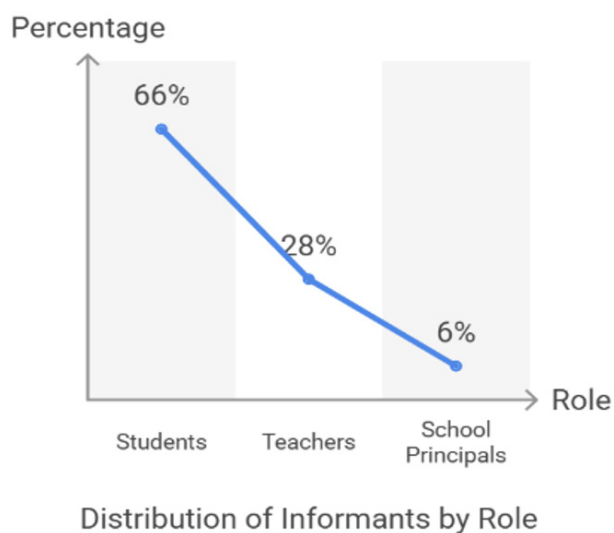
recurring patterns and emerging themes.¹² The analysis process included the following steps: Familiarize the data, Coding and categorizing, Developing themes and triangulation: cross-checking results using multiple sources to ensure reliability and validity.

Results and Discussion

Distribution of Informants

The research was conducted in three primary schools in Demak District: MIN 4, SD Negeri Batusari 5, and SD Negeri Batusari 6. These schools were selected because they received the National Adiwiyata School Award in 2024 (Decree of the Minister of Environment and Forestry No. 6,721, dated April 30, 2024), reflecting their commitment to environmental education. The selection of these schools was also based on the fact that, although still at the primary school level, they have successfully implemented a structured environmental education system, outperforming Demak's primary and secondary schools. Informants were distributed as follows:

Figure 1: Distribution of informants



¹² Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (January 1, 2006): 77–101, <https://doi.org/10.1191/1478088706qp0630a>.

Integrating Environmental Literacy Based on Tauhid into Islamic Education

The results of this study show that tauhid-based environmental literacy is effectively integrated into Islamic education through three main approaches: incorporating Quranic verses and Prophetic traditions on environmental protection, implementing sustainable development practices that are in line with Islamic ethical values, and adopting experiential learning models that emphasize environmental responsibility. Teachers and headmasters in the selected schools indicated that integrating theological principles into environmental education can improve students' understanding of environmental ethics. This finding is consistent with previous research that emphasizes the importance of religious teachings in shaping environmental awareness.¹³

At MIN 4, both teachers and students emphasized the transformative potential of integrating Islamic values into environmental education. T1 (Teacher) stated, "*Integrating Islamic teachings with environmental education helps students to realize their responsibility as guardians of the earth,*" highlighting how faith-based instruction reinforces ecological responsibility. S2 (Student) echoed this perspective, noting, "*I never used to think about the environment this way, but now I see it as part of my religious obligations,*" illustrating a shift in personal mindset and the internalization of environmental ethics as a component of religious duty.

At SD Negeri Batusari 5, the student and headmaster stressed the importance of moral grounding and institutional commitment. S1 (Student) reflected, "*After learning about khalifah fil ardh, I feel more responsible for protecting nature as part of my faith,*" showing how theological concepts can motivate personal action. A2 (Headmaster) added, "*A strong institutional commitment is fundamental for students to apply environmental*

¹³ J.L. Fua et al., "Islamic Education on Formation of Environmental Awareness in Pondok Pesantren Indonesia," vol. 156, 2018, <https://doi.org/10.1088/1755-1315/156/1/012035>.

principles daily,” underscoring the role of consistent school policies and leadership in sustaining environmentally responsible behavior.

At SD Negeri Batusari 6, the focus was on curriculum development and the availability of resources. A1 (Headmaster) emphasized, “Schools should develop a structured curriculum that links sustainability with Islamic values to ensure sustainable impact for students,” pointing to the need for systematic and long-term integration. However, T2 (Teacher) observed a significant barrier, explaining, “The lack of specialized educational resources on Islamic environmental ethics limits our ability to teach environmental literacy effectively,” indicating that without adequate materials, implementation remains constrained despite strong intentions. The table below provides a breakdown of responses to interviews with teachers, students and school headmasters:

Table 1: Coding of informants' answers to interview questions

Category	Answers to interview questions (n = 53)
Understanding ecology based on tauhid	82% of respondents noted the close relationship between Islamic teachings and environmental responsibility.
The role of educators in shaping environmental literacy	76% emphasized the importance of integrating Qur'anic principles into environmental education.
Practical application of environmental literacy	70% said they participate in sustainability initiatives inspired by Islamic teachings.
Realization problem	68% identified the lack of a structured curriculum as the main obstacle to developing Islamic education's environmental literacy.
Institutional support	60% felt that their school had adequate policies to support environmental literacy.

The results of this study confirm that tauhid-based environmental literacy plays an important

role in shaping students' environmental awareness.¹⁴ Integrating Islamic theological principles into sustainability education supports the argument that religious values can provide a moral and ethical basis for environmental management.¹⁵ This is consistent with previous research that emphasizes the role of religious education in developing environmental responsibility.¹⁶ However, this study extends the existing literature by providing empirical evidence that structured integration of environmental education focusing on tauhid leads to measurable behavior change among students. This factor has not been widely explored in previous research.

The results identified three primary mechanisms Islamic education uses to enhance environmental literacy: theological learning, experiential learning, and institutional support. These mechanisms are consistent with Sterling's conceptualization of education for sustainable development, which emphasizes transformational learning that promotes environmental awareness.¹⁷ However, in this study, tauhid is viewed as the foundation of sustainable development, distinguishing it from secular approaches focusing only on scientific and political environmental literacy.¹⁸

¹⁴ Rahman, Zabidi, and Halim, “Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives.”

¹⁵ Nasr, *Religion & the Order of Nature*; A.A. Anshori and F. Pohl, “Environmental Education and Indonesia's Traditional Islamic Boarding Schools: Curricular and Pedagogical Innovation in the Green Pesantren Initiative,” in *Supporting Modern Teaching in Islamic Schools: Pedagogical Best Practice for Teachers*, 2022, 31–44, <https://doi.org/10.4324/9781003193432-4>.

¹⁶ Asma'ul Lutfauziah et al., “Curriculum Development for Environmental Education at an Islamic Boarding School,” *Journal of Turkish Science Education* 20, no. 3 (October 1, 2023): 490–503, <https://doi.org/10.36681/tused.2023.028>.

¹⁷ Sterling, *Sustainable Education*; A. Djirong et al., “Assessment of Student Awareness and Application of Eco-Friendly Curriculum and Technologies in Indonesian Higher Education for Supporting Sustainable Development Goals (SDGs): A Case Study on Environmental Challenges,” *Indonesian Journal of Science and Technology* 9, no. 3 (2024): 657–78, <https://doi.org/10.17509/ijost.v9i3.74385>.

¹⁸ Rockström et al., “A Safe Operating Space for Humanity”; Farida et al., “Project-Based Teaching and Learning Design for Internalization of Environmental Literacy with Islamic Values.”



Although previous research recognizes the effectiveness of religion-integrated education for sustainable development,¹⁹ this study identifies key challenges that remain. The lack of a structured curriculum and scarcity of educational resources on Islamic environmental ethics are key barriers, reflecting Rahman's findings.²⁰ This suggests an urgent need to develop a curriculum that links Islamic teachings with environmental protection.

The study also revealed important differences between schools with strong institutional support and schools with limited administrative support. Schools that implemented environmental policies structured around Islamic values showed greater student engagement in sustainability initiatives. This corroborates the findings of Orr, who stated that institutional support significantly affects environmental literacy outcomes.²¹

Pedagogical strategies for Environmental Education Based on Tauhid

Educators used a variety of pedagogical strategies to enhance environmental literacy through an Islamic framework. These strategies include incorporating Quranic interpretations of environmental ethics into the science and religion curriculum, promoting experiential learning activities in nature, and encouraging school-wide sustainability initiatives such as tree planting campaigns and waste reduction programs. Observational data showed that students exposed to these strategies became more aware of their ethical responsibility

towards nature. This finding supports previous research, which suggests that religious education can be a powerful tool to promote environmental responsibility.²²

Interviews with teachers, students, and headmasters reveal how Islamic values are being connected to environmental responsibility within schools. T1 (Teacher) observed, *"Integrating Islamic teachings with environmental education helps students to realize their responsibility as guardians of the earth,"* highlighting the moral foundation that faith provides for ecological stewardship. S1 (Student) shared, *"After learning about khalifah fil ardh, I feel more responsible for protecting nature as part of my faith,"* illustrating how theological concepts can shape personal commitment to sustainability. A1 (Headmaster) emphasized, *"Schools should develop a structured curriculum that links sustainability with Islamic values to ensure sustainable impact for students,"* pointing to the need for systematic integration in educational planning. T2 (Teacher) noted, *"The lack of specialized educational resources on Islamic environmental ethics limits our ability to teach environmental literacy effectively,"* identifying resource scarcity as a barrier to implementation. Similarly, S2 (Student) reflected, *"I never used to think about the environment this way, but now I see it as part of my religious obligations,"* showing how environmental awareness can be reframed through religious duty. Finally, A2 (Headmaster) affirmed, *"A strong institutional commitment is fundamental for students to apply environmental principles daily,"* underscoring the role of consistent school policies in sustaining environmentally responsible behavior.

¹⁹ R.I. Mokotso, "Enhancing Religious Education Teaching and Learning for Sustainable Development in Lesotho," *HTS Teologiese Studies / Theological Studies* 80, no. 1 (2024), <https://doi.org/10.4102/hts.v80i1.9151>; N.L. Inayati et al., "DEVELOPMENT OF RELIGIOUS EDUCATION IN JUNIOR HIGH SCHOOLS FOR SUSTAINABLE DEVELOPMENT GOALS (SDGS): A STUDY IN SURAKARTA," *Journal of Lifestyle and SDG'S Review* 5, no. 2 (2025), <https://doi.org/10.47172/2965-730X.SDGsReview.v5.no2.peo4411>.

²⁰ Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

²¹ Orr, *Ecological Literacy*.

²² Orr; A. Begum et al., "Evaluating the Impact of Environmental Education on Ecologically Friendly Behavior of University Students in Pakistan: The Roles of Environmental Responsibility and Islamic Values," *Sustainability (Switzerland)* 13, no. 18 (2021), <https://doi.org/10.3390/su131810188>.

Table 2: Distribution of answers to interview questions, frequency and interpretation

Category	Freq (n=53)	Perc. (%)
Understanding ecology based on tauhid	43	81%
The role of educators in shaping environmental literacy	40	76%
Practical application of environmental literacy	37	70%
Realization problem	36	68%
Institutional support	32	60%

The observations and documentation from the research centers reveal an intentional integration of faith-based principles into environmental education. The Quranic verses are integrated into lessons, demonstrating the active inclusion of Islamic teachings on the environment within the education system, thereby reinforcing ecological responsibility through a spiritual lens. Student participation in sustainable development projects is notably high, reflecting strong engagement in ecological initiatives and indicating a deepening understanding of environmental stewardship among learners. The implementation of a school-wide environmental policy signals a moderate yet growing commitment to institutional practices that support sustainable development, ensuring that environmental awareness is embedded at the organizational level. Meanwhile, the use of Islamic resources to teach ecology is emerging as a pedagogical approach, although the availability of such materials remains limited, highlighting the need for further development and dissemination. Collectively, these observed factors illustrate a holistic educational model that merges environmental literacy with Islamic ethical values, fostering both knowledge and moral responsibility.

The integration of tauhid-based environmental literacy into Islamic education is consistent with the global education model for sustainable development despite providing a separate religious foundation. This study confirms that religion-integrated environmental education can increase students'

environmental awareness and responsibility.²³ The high level of engagement in sustainability initiatives suggests that incorporating Islamic ethical values encourages a sense of care for the environment.²⁴ However, the research also revealed significant challenges, specifically the need for a structured curriculum, more excellent institutional support and the development of Islamic environmental education resources.

Sterling argues that transformational education for sustainability is based on a holistic approach,²⁵ but the tauhid-based model extends this idea to include theological learning, experiential learning and institutional policies. This aligns with the conclusions of Rahman who emphasize that religious education for sustainability can complement secular frameworks for environmental literacy.²⁶ In contrast to secular models that focus on the political and scientific nature of environmental education,²⁷ tauhid-centered approaches uniquely position spirituality as one of the key drivers of sustainable behavior.

Despite its effectiveness, implementing faith-based environmental education still presents challenges. Similar to the limitations identified by Rahman, this study shows that the lack of structured teaching materials and limited administrative reinforcement hinder comprehensive integration.²⁸ In addition, while previous research has focused on theoretical discussions of Islamic environmental

²³ Nasr, *Religion & the Order of Nature*; Fua et al., "Islamic Education on Formation of Environmental Awareness in Pondok Pesantren Indonesia."

²⁴ Rahman et al., "ABORDAGENS SOCIO-ECOLÓGICAS-CULTURAIS NA ABORDAGEM DOS DANOS AMBIENTAIS: UMA ANÁLISE INTERPRETATIVA BASEADA NO ALCORÃO E HADITH."

²⁵ Sterling, *Sustainable Education*.

²⁶ Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

²⁷ Rockström et al., "A Safe Operating Space for Humanity"; Begum et al., "Evaluating the Impact of Environmental Education on Ecologically Friendly Behavior of University Students in Pakistan."

²⁸ Rahman et al., "ABORDAGENS SOCIO-ECOLÓGICAS-CULTURAIS NA ABORDAGEM DOS DANOS AMBIENTAIS: UMA ANÁLISE INTERPRETATIVA BASEADA NO ALCORÃO E HADITH."

ethics,²⁹ this study empirically validates these concepts through field observations and participant responses.

Perceptions and Changes in Student Behavior

Interviews with students revealed changes in their environmental awareness and behavior. Many expressed a greater responsibility toward environmental conservation and cited religious motivation as a key factor in changing their behavior. Most participants expressed a new understanding of environmental ethics as an extension of their faith, which supports the argument that religion-integrated environmental literacy promotes environmental stewardship. This aligns with Rahman's research, which found that Islamic teachings on *khalifah fil ardh* (stewardship) are important in promoting environmentally conscious behavior.³⁰

Interviews with students illustrate how religious values, awareness, and school initiatives intersect to shape environmental responsibility. In terms of religious motivation, S1 (Student) reflected, “After learning about *khalifah fil ardh*, I realized that protecting the environment is part of my faith,” underscoring the theological grounding of ecological stewardship. On raising awareness, S2 (Student) admitted, “I did not think much of nature before, but now I feel I have a responsibility to keep it clean and safe,” highlighting a shift in perception toward personal accountability. Regarding behavior change, S3 (Student) explained, “Now I remind my friends to throw trash in its place because it is our obligation as Muslims,” revealing how religious ethics are translated into daily actions. In the area of sustainable practices, S4 (Student) shared, “At home, I encourage my family to save water and plant trees because that is what I learned in school,” demonstrating the extension of school-based environmental learning

into the household. Finally, on the theme of school initiative, S5 (Student) stated, “Our school teaches us to reduce waste; we have recycling projects and plant trees,” reflecting structured institutional programs that integrate sustainability into student life.

Table 3. Distribution of answers to interview questions, frequency and interpretation

Category	Freq. (n=35)	Perc (%)
Awareness of environmental ethics	28	80%
Behavior change	25	71%
Influence of religious teachings	30	86%
Participation in school initiatives	27	77%
Coherence problem	18	51%

The observations and documentation from the research centers demonstrate a strong emphasis on integrating faith-based perspectives into environmental education. The inclusion of verses from the Quran in the lessons reflects a deliberate effort to create a strong connection between religious teachings and ecological awareness, ensuring that environmental responsibility is framed within a spiritual context. Student participation in sustainable development projects is evident through active involvement in various environmental initiatives within the school environment, fostering both practical skills and ethical responsibility. The school waste management program illustrates the adoption of structured waste reduction strategies, indicating an institutional commitment to sustainable practices. Efforts such as the water saving awareness campaign are already in place, though they remain a work in progress and require stronger reinforcement within the curriculum to achieve lasting behavioral change. Additionally, faith-based discussion on sustainable development shows that Islamic values are frequently incorporated into environmental lessons, further aligning ecological stewardship with moral and religious obligations. Together, these factors reveal a comprehensive approach

²⁹ Nasr, *Religion & the Order of Nature*; A. Baharuddin and M.N. Musa, “Environmental Ethics in Islam,” in *Islamic Bioethics: Current Issues and Challenges*, 2017, 161–82, https://doi.org/10.1142/9781783267507_0008.

³⁰ Rahman, Zabidi, and Halim, “Integration of Tauhidic Elements for Environmental Education from the Teachers’ Perspectives.”

that intertwines environmental sustainability with Islamic education, promoting both ecological literacy and ethical consciousness.

The results of this study highlight the role of faith-based environmental literacy in shaping students' environmental behavior. Integrating Islamic teachings increases awareness, encourages behavior change, and strengthens commitment to sustainable practices in school and home environments.

The results of this study confirm that faith-based environmental literacy rooted in tauhid significantly impacts students' environmental awareness and behavior. This is consistent with previous research that emphasizes the role of Islamic teachings in promoting environmental responsibility.³¹ Students understood their ethical responsibility toward nature, reinforcing the idea that religious principles provide a moral framework for environmental.³² The high level of student involvement in sustainability projects reflects similar findings by Nasr and Helli, who stated that integrating religious values enhances environmental responsibility.³³

The main contribution of this study is to identify behavioral changes associated with tauhid-oriented environmental education. Previous research by Lutfauziah emphasized the importance of experiential learning in environmental education.³⁴ However, this study extends that perspective by showing how theological learning contributes to intrinsic motivation for sustainability. In contrast to secular environmental education models that emphasize scientific and political approaches,³⁵ the Islamic framework places environmental awareness

in a spiritual and ethical context, leading to long-term behavior change.

Despite its effectiveness, there are still challenges to sustaining students' environmental engagement beyond the school environment. Like Rahman's findings, this study shows that while students are enthusiastic about sustainability initiatives, their ability to maintain environmentally friendly habits outside of structured school programs remains inconsistent.³⁶ This emphasizes the need for closer collaboration between schools and communities to promote faith-based environmental literacy in home and social settings.³⁷

Institutional Commitment to Sustainable Development

The study also found that schools with strong institutional support for sustainable development have more comprehensive environmental literacy programs. Schools with environmental policies aligned with Islamic values implement structured programs, such as green space allocation, sustainable waste management systems and conservation-focused extracurricular activities. This institutional commitment improves students' environmental literacy and strengthens the school community's environmental responsibility culture.

Interviews with stakeholders reveal how policy, resources, and participation intersect in promoting sustainability within Islamic educational settings. In discussing policy implementation, A1 (Headmaster) remarked, "Our school has integrated Islamic values into its environmental policy to ensure sustainability across the curriculum," emphasizing the deliberate alignment of environmental stewardship with

³¹ Nasr, *Religion & the Order of Nature*; Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

³² M. Muhammadi and H.R. Haftador, "Basic Principles of Environmental Ethics in Islamic Discourse," *Advances in Environmental Biology* 8, no. 4 (2014): 947–52.

³³ Nasr, *The Heart of Islam*; A. Helli, "Does the Qur'an Offer Foundational Principles for Environmental Ethics?," *Journal of Islamic Ethics* 6, no. 2 (2024), <https://doi.org/10.1163/24685542-20240003>.

³⁴ Lutfauziah et al., "Curriculum Development for Environmental Education at an Islamic Boarding School."

³⁵ Rockström et al., "A Safe Operating Space for Humanity."

³⁶ Rahman et al., "ABORDAGENS SOCIO-ECOLÓGICAS-CULTURAIS NA ABORDAGEM DOS DANOS AMBIENTAIS: UMA ANÁLISE INTERPRETATIVA BASEADA NO ALCORÃO E HADITH."

³⁷ K.D. Warner, A. Brook, and K. Shaw, "Facilitating Religious Environmentalism: Ethnology plus Conservation Psychology Tools Can Assess an Interfaith Environmental Intervention," *Worldviews: Environment, Culture, Religion* 16, no. 2 (2012): 111–34, <https://doi.org/10.1163/156853512X640833>; L.S. Coley, E.S. Howze, and K. McManamy, "Faith-Based Community-Academic Partnerships: An Asset-Based Community Development Strategy for Social Change," *Gateways* 16, no. 2 (2023), <https://doi.org/10.5130/ijcre.v16i2.8672>.

religious principles. On institutional support, T1 (Teacher) shared, *“With the administration’s active support, we have successfully implemented ecological initiatives in the school,”* highlighting the enabling role of leadership in sustaining green programs. Addressing resource allocation, A2 (Headmaster) acknowledged, *“Funding and resources for environmental projects remain challenging, but we are committed to prioritizing sustainability,”* indicating both constraints and determination. From the perspective of student participation, S1 (Student) noted, *“The school offers many opportunities for us to engage in environmental education programs, such as planting trees and recycling,”* pointing to active involvement and experiential learning. Finally, in terms of curriculum integration, T2 (Teacher) affirmed, *“We ensure that environmental literacy is integrated with religion and science subjects to reinforce the importance of being responsible stewards of nature,”* underscoring a multidisciplinary approach that embeds ecological responsibility across different areas of study.

Table 4: Distribution of answers to interview questions, frequency and interpretation

Category	Freq (n=53)	Perc (%)
Institutional commitment to sustainable development	40	75%
Integration of environmental policies	35	66%
Student participation in "green" initiatives	38	72%
Funding and resource challenges	30	57%
Administrative support for teachers	33	62%

The observations and documentation from the research centers highlight a strong institutional commitment to school waste management programs, reflecting well-established waste reduction strategies that are actively maintained within the school environment. Efforts in green space and tree planting demonstrate that schools are intentionally creating eco-friendly spaces, contributing both to environmental quality and to aesthetic improvements

in the learning atmosphere. The practice of integrating sustainable development into the curriculum indicates that environmental education has been systematically embedded into teaching materials, ensuring that ecological awareness is cultivated alongside other academic competencies. Furthermore, the presence of a religious, environmental policy shows that Islamic principles are explicitly incorporated into sustainable development strategies, aligning ecological responsibility with spiritual and ethical values. In addition, extracurricular activities on nature conservation provide students with direct opportunities to engage in practical sustainability projects, fostering hands-on experience and reinforcing classroom learning. Collectively, these observed factors illustrate a holistic approach to sustainability in education, where environmental stewardship is integrated into both policy and practice, underpinned by religious values and active student participation.

Institutional commitment plays a key role in the development of environmental literacy in Islamic education, as confirmed by this study. Schools that actively implement sustainability initiatives based on tauhid show greater student engagement in caring for the environment, confirming previous research highlighting institutional policies' role in shaping environmental behavior.³⁸ The systematic incorporation of Islamic values into sustainability policies strengthens students' moral and ethical responsibility towards the environment, consistent with Nasr's assertion that spiritual awareness is a key factor in environmental ethics.³⁹

³⁸ G. Cogut et al., “Links between Sustainability-Related Awareness and Behavior: The Moderating Role of Engagement,” *International Journal of Sustainability in Higher Education* 20, no. 7 (2019): 1240–57, <https://doi.org/10.1108/IJSHE-09-2018-0161>; T. Rahmania, “Exploring School Environmental Psychology in Children and Adolescents: The Influence of Environmental and Psychosocial Factors on Sustainable Behavior in Indonesia,” *Heliyon* 10, no. 18 (2024), <https://doi.org/10.1016/j.heliyon.2024.e37881>; N. Gericke, “Implementation of Education for Sustainable Development Through a Whole School Approach,” *Sustainable Development Goals Series Part F2743* (2022): 153–66, https://doi.org/10.1007/978-3-031-09112-4_11; Baharuddin and Musa, “Environmental Ethics in Islam.”

³⁹ R. R. Rizk, “Islamic Environmental Ethics,” *Journal of Islamic Accounting and Business Research* 5, no. 2 (2014): 194–204, <https://doi.org/10.1108/JIABR-09-2012-0060>; Nasr, *Religion & the Order of Nature*.

Comparing these findings with Sterling's transformational learning model, institutional influence in Islamic education goes beyond knowledge acquisition and extends to behavioral transformation.⁴⁰ In contrast to secular approaches that focus on applying scientific principles and policies,⁴¹ religious education for sustainable development encourages intrinsic motivation by reinforcing long-term behavior change. Schools with structured green policies have higher levels of student participation in green initiatives, reflecting the findings of Uzorka, who emphasized the direct correlation between institutional support and green activism.⁴²

However, significant challenges remain regarding funding and resource allocation for sustainability programs. Like Rahman's findings,⁴³ this study sees financial constraints as a barrier to fully implementing Islamic environmental literacy. Although educational institutions recognize the importance of sustainability education, inadequate funding limits their ability to provide comprehensive teaching materials and support sustainable program development.⁴⁴ This suggests the need for strategic partnerships between educational institutions, environmental organizations and policy makers to improve resource availability and integration.⁴⁵

⁴⁰ Sterling, *Sustainable Education*.

⁴¹ Rockström et al., "A Safe Operating Space for Humanity."

⁴² A. Uzorka, O. Akiyode, and S.M. Isa, "Strategies for Engaging Students in Sustainability Initiatives and Fostering a Sense of Ownership and Responsibility towards Sustainable Development," *Discover Sustainability* 5, no. 1 (2024), <https://doi.org/10.1007/s43621-024-00505-x>.

⁴³ Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

⁴⁴ D. Bonilla-Jurado et al., "Advancing University Education: Exploring the Benefits of Education for Sustainable Development," *Sustainability (Switzerland)* 16, no. 17 (2024), <https://doi.org/10.3390/su16177847>; C.H. Yang, R. Lin, and P.-H. Lin, "Application of Experience Design in Environmental Education Experience Activities," *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* 12772 LNCS (2021): 251–64, https://doi.org/10.1007/978-3-030-77077-8_20.

⁴⁵ M.I. Razumovskaya et al., "Models of Integrated Interactions Organization in the Field of Environmental Education," *Journal of Environmental Treatment Techniques* 7, no. 4 (2019): 576–80.

Challenges in Implementing Tauhid-Based Ecological Literacy

Interviews with key stakeholders revealed several recurring themes that reflect both the strengths and challenges in integrating Islamic environmental ethics into educational practice. In the area of curriculum development, T1 (Teacher) emphasized, "We need more structured materials that link Islamic teachings with environmental literacy," highlighting the absence of cohesive learning resources that connect faith-based principles with ecological awareness. Addressing the challenge of limited resources, A1 (Headmaster) noted, "There is a lack of educational resources integrating a religious, environmental ethic," underscoring the scarcity of appropriate teaching materials. The issue of institutional support was also raised, with T2 (Teacher) stating, "More administrative support is needed to implement the continuing education program fully," indicating that organizational backing remains crucial for sustaining such initiatives. From the perspective of student participation, S1 (Student) observed, "Some of my colleagues do not take environmental issues seriously because they do not see it as part of religion," revealing gaps in awareness and engagement. Finally, in discussing the need for cooperation, A2 (Headmaster) expressed, "We need closer partnerships between Islamic institutions and environmental organizations," pointing to the importance of collaborative networks in strengthening the impact and sustainability of environmental education rooted in Islamic values.

Table 5: Distribution of answers to interview questions, frequency and interpretation

Category	Freq (n=53)	Perc. (%)
The need for a structured training program	42	79%
Lack of religious and environmental resources	39	74%
Limited institutional support	35	66%
Issues related to student participation	30	57%
Need for external cooperation	33	62%

The observations and documentation from the research centers indicate that the integration of Islamic environmental principles into the curriculum has been applied at a moderate level, yet without a fully structured and systematic framework to guide its consistent implementation. The availability of faith-based sustainable materials remains limited, creating a significant barrier to effective teaching and often compelling educators to rely on generic resources that lack alignment with the intended spiritual and ethical dimensions. Furthermore, institutional funding for sustainable development programs is still insufficient, restricting the capacity to design and sustain long-term initiatives that combine ecological awareness with Islamic teachings.

Although some progress has been made in training teachers in environmental literacy, the efforts remain partial and require further development to address both pedagogical strategies and theological foundations. Meanwhile, student participation in sustainable development programs is evident, reflecting active engagement in many cases; however, disparities between schools indicate uneven access, institutional support, and program quality. Collectively, these factors highlight the urgency of a more comprehensive and equitable approach that strengthens resources, enhances teacher capacity, and establishes standardized frameworks to embed Islamic environmental ethics effectively in educational practice.

The implementation of tauhid-based environmental literacy presents significant opportunities and great challenges.⁴⁶ While previous research has emphasized the potential of integrating religious values into environmental education (Nasr and Rahman),⁴⁷ this study identified critical gaps that hinder its full implementation. One of the main challenges is the lack of a structured curriculum that

explicitly links Islamic teachings to environmental responsibility. As noted in Rahman's study, faith-based environmental ethics remains theoretical mainly, without systematic integration into the curriculum.⁴⁸ The results of this study provide empirical evidence of this issue, as most teachers expressed the need for standardized teaching materials to address this gap.

Another major challenge is the lack of faith-based environmental resources. Unlike secular models of education for sustainable development, which have extensive political support and resources,⁴⁹ Islamic environmental education lacks widely available teaching materials. This is consistent with the findings of Kurttekin and Wakhidah, who emphasized that the lack of structured Islamic environmental education resources limits the effectiveness of faith-based environmental literacy.⁵⁰ The study's results support this argument, indicating that institutional constraints in resource allocation hinder integrated implementation.

Institutional support is critical to the success of continuing education; however, this study shows that many schools struggle to secure administrative and political support.⁵¹ Although Moreno and Roos

⁴⁸ Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

⁴⁹ Rockström et al., "A Safe Operating Space for Humanity."

⁵⁰ F. Kurttekin, "Is There a Place for Environmental Education in Religious Education in Türkiye?," *Journal of Beliefs and Values*, 2024, <https://doi.org/10.1080/13617672.2024.2343596>; Wakhidah and Erman, "Examining Environmental Education Content on Indonesian Islamic Religious Curriculum and Its Implementation in Life."

⁵¹ E. Chinomona and K.C. Moloi, "The Role Played by Institutional Support in the Commitment, Job Satisfaction and Employee Performance of Teachers in Gauteng Province of South Africa: A Social Exchange Perspective," *Mediterranean Journal of Social Sciences* 5, no. 2 (2014): 303–15, <https://doi.org/10.5901/mjss.2014.v5n2p303>; A. Holmes, "What Are the Barriers and Opportunities for Continuing Professional Development for Professional Services Staff in UK HE?," *Perspectives: Policy and Practice in Higher Education* 24, no. 3 (2020): 79–86, <https://doi.org/10.1080/13603108.2020.1750501>; A. Leow et al., "Graduates' Perspectives on Effective Continuing Education and Training: Participation, Access and Engagement," *International Journal of Lifelong Education* 41, no. 2 (2022): 212–28, <https://doi.org/10.1080/02601370.2022.2044398>.

⁴⁶ Shahida, "Green Academia: Integrating Islamic Teachings in Education for a Sustainable Future," *Journal of Islamic Thought and Civilization* 13, no. 2 (2023): 86–103, <https://doi.org/10.32350/jitc.132.06>.

⁴⁷ Nasr, *Religion & the Order of Nature*; Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

emphasized the importance of strong institutional structures in sustainability education, this study revealed differences in institutional commitment.⁵² Schools with clear administrative policies on environmental literacy showed greater student engagement,⁵³ while schools without structured policies faced significant barriers to implementation. This emphasizes the need to strengthen policies at the institutional level to ensure the sustainability of religiously integrated education for sustainable development.⁵⁴

Student engagement was also challenging, as some students did not fully recognize environmental responsibility as an integral part of their religious identity.⁵⁵ While previous research (Rahman) showed that Islamic teachings contribute to a strong ethical foundation for sustainability,⁵⁶ this study revealed inconsistencies in student motivation. The results

of this study suggest that while Islamic teachings can be a powerful tool for environmental education, their impact depends on effective teaching and institutional strengthening.⁵⁷

The results of this study highlight the urgent need for integrated curriculum development, more excellent institutional support, and cross-sector collaboration to fully integrate tauhid-based environmental literacy into the education system. Future research should focus on policy interventions to strengthen religious education for sustainable development within a broader ecological framework.

Thus, this study shows that integrating tauhid-based environmental literacy into Islamic education contributes to developing a deep sense of environmental responsibility among students. The combination of theological education, practical training and institutional support helps provide an effective framework for environmental education in the Islamic context. Despite the challenges that remain, the results of this study provide valuable recommendations for policymakers, educators and researchers interested in developing faith-based approaches to sustainable education.

Conclusion

This study demonstrates that tauhid-based environmental literacy is pivotal in fostering environmental awareness within Islamic education. Through the integration of theological teaching, experiential learning, and institutional engagement, Islamic educational institutions have embedded sustainable development principles into their curricula, resulting in students who exhibit stronger environmental awareness and responsibility. These

⁵² N. Roos and E. Guenther, "Sustainability Management Control Systems in Higher Education Institutions from Measurement to Management," *International Journal of Sustainability in Higher Education* 21, no. 1 (2020): 144–60, <https://doi.org/10.1108/IJSHE-01-2019-0030>; J. Moreno-Serna et al., "Driving Transformational Sustainability in a University Through Structural and Academic Innovation: A Case Study of A Public University in Spain," *Advances in Engineering Education* 10, no. 1 (2022).

⁵³ B. Ye et al., "Impact of Environmental Programs on Student Test Scores Mediated by School Attendance Rate," *Hygiene and Environmental Health Advances* 4 (2022), <https://doi.org/10.1016/j.heha.2022.100028>.

⁵⁴ Inayati et al., "DEVELOPMENT OF RELIGIOUS EDUCATION IN JUNIOR HIGH SCHOOLS FOR SUSTAINABLE DEVELOPMENT GOALS (SDGS)"; C. Gärtner, "Saving the World with Religious Education? Spannungsfelder Einer Politischen Religiösen Bildung Für Nachhaltige Entwicklun," *Osterreichisches Religionspädagogisches Forum* 28, no. 2 (2020): 47–64, <https://doi.org/10.25364/10.28:2020.2.4>.

⁵⁵ S. Zeng, L. Wu, and T. Liu, "Religious Identity and Public Pro-environmental Behavior in China: The Mediating Role of Environmental Risk Perception," *Religions* 11, no. 4 (2020), <https://doi.org/10.3390/rel11040165>; N.M. Sukrawati, "Maximizing Student Engagement in Hindu Education: A Study of Curriculum Content, Parental Involvement, and School Leadership Practices," *Eurasian Journal of Educational Research* 2022, no. 102 (2022): 133–52, <https://doi.org/10.14689/ejer.2022.102.008>; M. Briguglio, T. Garcia-Munoz, and S. Neuman, "Environmental Engagement, Religion and Spirituality in the Context of Secularization," *Environmental Research Letters* 15, no. 10 (2020), <https://doi.org/10.1088/1748-9326/abb6a0>.

⁵⁶ Rahman, Zabidi, and Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives."

⁵⁷ Fua et al., "Islamic Education on Formation of Environmental Awareness in Pondok Pesantren Indonesia"; D.A. Setianingrum, Setiyo, and A. Dwiyanto, "Environmental Education through Islamic Lens: Values and Practices," vol. 482, 2024, <https://doi.org/10.1051/e3sconf/202448204014>; M. Najib et al., "Environmental Conservation Paradigm in Islamic Ecological Perspective," *International Journal of Psychosocial Rehabilitation* 24, no. 4 (2020): 5440–47, <https://doi.org/10.37200/IJPR/V24I4/PR201640>.

findings affirm that Islamic teachings provide a robust ethical foundation for sustainability, while also revealing persistent challenges, including the absence of a structured curriculum, limited resources, and inconsistent institutional support.

The implications extend beyond Islamic education, offering a distinctive framework that unites spiritual, ethical, and scientific dimensions, in contrast to secular environmental education models. The study underscores the urgency of developing standardized curricula that incorporate Islamic environmental ethics and of forging partnerships between Islamic institutions and environmental organizations to enhance resources and policy backing. As an empirical contribution, it bridges theoretical discourse and practical application, evidencing the role of tauhid in shaping environmental literacy. Future research should examine the long-term behavioral impacts, formulate policies to institutionalize faith-based sustainability initiatives, and assess their cross-cultural applicability, thereby reinforcing Islamic education's role in advancing global environmental literacy.

References

- Ansari, A.H., P. Jamal, and U.A. Oseni. "Sustainable Development: Islamic Dimension with Special Reference to Conservation of the Environment." *Advances in Natural and Applied Sciences* 6, no. 5 SPLISS. 4 (2012): 607–19.
- Anshori, A.A., and F. Pohl. "Environmental Education and Indonesia's Traditional Islamic Boarding Schools: Curricular and Pedagogical Innovation in the Green Pesantren Initiative." In *Supporting Modern Teaching in Islamic Schools: Pedagogical Best Practice for Teachers*, 31–44, 2022. <https://doi.org/10.4324/9781003193432-4>.
- Baharuddin, A., and M.N. Musa. "Environmental Ethics in Islam." In *Islamic Bioethics: Current Issues and Challenges*, 161–82, 2017. https://doi.org/10.1142/9781783267507_0008.
- Begum, A., J. Liu, I.U.K. Marwat, S. Khan, H. Han, and A. Ariza-Montes. "Evaluating the Impact of Environmental Education on Ecologically Friendly Behavior of University Students in Pakistan: The Roles of Environmental Responsibility and Islamic Values." *Sustainability (Switzerland)* 13, no. 18 (2021). <https://doi.org/10.3390/su131810188>.
- Bogdan, Robert. *Qualitative Research for Education: An Introduction to Theory and Methods*. Boston: Allyn and Bacon, 1998. <http://archive.org/details/qualitativerese0000bogd>.
- Bonilla-Jurado, D., E. Zumba, A. Lucio-Quintana, C. Yerbabuena-Torres, A. Ramírez-Casco, and C. Guevara. "Advancing University Education: Exploring the Benefits of Education for Sustainable Development." *Sustainability (Switzerland)* 16, no. 17 (2024). <https://doi.org/10.3390/su16177847>.
- BR, R. "Teachers' Belief and Practice in Environmental Education: Evidence from an Indonesian Islamic Primary School." *Education* 3-13, 2024. <https://doi.org/10.1080/03004279.2024.2351553>.
- Braun, Virginia, and Victoria Clarke. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3, no. 2 (January 1, 2006): 77–101. <https://doi.org/10.1191/1478088706qp0630a>.
- Briguglio, M., T. Garcia-Munoz, and S. Neuman. "Environmental Engagement, Religion and Spirituality in the Context of Secularization." *Environmental Research Letters* 15, no. 10 (2020). <https://doi.org/10.1088/1748-9326/abb6a0>.
- Chinomona, E., and K.C. Moloi. "The Role Played by Institutional Support in the Commitment, Job Satisfaction and Employee Performance of Teachers in Gauteng Province of South Africa: A Social Exchange Perspective." *Mediterranean Journal of Social Sciences* 5, no. 2 (2014): 303–15. <https://doi.org/10.5901/mjss.2014.v5n2p303>.
- Cogut, G., N.J. Webster, R.W. Marans, and J. Callewaert. "Links between Sustainability-Related Awareness and Behavior: The Moderating Role of Engagement." *International Journal of Sustainability in Higher Education* 20, no. 7 (2019): 1240–57. <https://doi.org/10.1108/IJSHE-09-2018-0161>.

- Coley, L.S., E.S. Howze, and K. McManamy. "Faith-Based Community-Academic Partnerships: An Asset-Based Community Development Strategy for Social Change." *Gateways* 16, no. 2 (2023). <https://doi.org/10.5130/ijcre.v16i2.8672>.
- Djirong, A., K. Jayadi, A. Abduh, A. Mutolib, R.F. Mustofa, and A. Rahmat. "Assessment of Student Awareness and Application of Eco-Friendly Curriculum and Technologies in Indonesian Higher Education for Supporting Sustainable Development Goals (SDGs): A Case Study on Environmental Challenges." *Indonesian Journal of Science and Technology* 9, no. 3 (2024): 657–78. <https://doi.org/10.17509/ijost.v9i3.74385>.
- Farida, I., Hadiansah, Mahmud, and A. Munandar. "Project-Based Teaching and Learning Design for Internalization of Environmental Literacy with Islamic Values." *Jurnal Pendidikan IPA Indonesia* 6, no. 2 (2017): 277–84. <https://doi.org/10.15294/jpii.v6i2.9452>.
- Frank, D.J., K.J. Robinson, and J. Olesen. "The Global Expansion of Environmental Education in Universities." *Comparative Education Review* 55, no. 4 (2011): 546–73. <https://doi.org/10.1086/661253>.
- Fua, J.L., R.U. Nurlila, F. Gunawan, and I.S. Wekke. "Islamic Education on Formation of Environmental Awareness in Pondok Pesantren Indonesia," Vol. 156, 2018. <https://doi.org/10.1088/1755-1315/156/1/012035>.
- Gärtner, C. "Saving the World with Religious Education? Spannungsfelder Einer Politischen Religiösen Bildung Für Nachhaltige Entwicklun." *Osterreichisches Religionspädagogisches Forum* 28, no. 2 (2020): 47–64. <https://doi.org/10.25364/10.28:2020.2.4>.
- Gericke, N. "Implementation of Education for Sustainable Development Through a Whole School Approach." *Sustainable Development Goals Series Part F2743* (2022): 153–66. https://doi.org/10.1007/978-3-031-09112-4_11.
- Helli, A. "Does the Qu'ân Offer Foundational Principles for Environmental Ethics?" *Journal of Islamic Ethics* 6, no. 2 (2024). <https://doi.org/10.1163/24685542-20240003>.
- Holmes, A. "What Are the Barriers and Opportunities for Continuing Professional Development for Professional Services Staff in UK HE?" *Perspectives: Policy and Practice in Higher Education* 24, no. 3 (2020): 79–86. <https://doi.org/10.1080/13603108.2020.1750501>.
- Inayati, N.L., T.A. Mustofa, A.F. Rohmani, F.N. Anggraini, and Muthoifin. "DEVELOPMENT OF RELIGIOUS EDUCATION IN JUNIOR HIGH SCHOOLS FOR SUSTAINABLE DEVELOPMENT GOALS (SDGS): A STUDY IN SURAKARTA." *Journal of Lifestyle and SDG'S Review* 5, no. 2 (2025). <https://doi.org/10.47172/2965-730X.SDGsReview.v5.no2.peo4411>.
- John W. Creswell, and Cheryl N. Poth. "Qualitative Inquiry and Research Design." SAGE Publications Inc, 2018. <https://us.sagepub.com/en-us/nam/qualitative-inquiry-and-research-design/book266033>.
- Knott, E., A.H. Rao, K. Summers, and C. Teeger. "Interviews in the Social Sciences." *Nature Reviews Methods Primers* 2, no. 1 (2022). <https://doi.org/10.1038/s43586-022-00150-6>.
- Kurttekin, F. "Is There a Place for Environmental Education in Religious Education in Türkiye?" *Journal of Beliefs and Values*, 2024. <https://doi.org/10.1080/13617672.2024.2343596>.
- Leow, A., S. Billett, A.H. Le, and S. Chua. "Graduates' Perspectives on Effective Continuing Education and Training: Participation, Access and Engagement." *International Journal of Lifelong Education* 41, no. 2 (2022): 212–28. <https://doi.org/10.1080/02601370.2022.2044398>.
- Lutfauziah, Asma'ul, Mimien Henie Irawati Al-Muhdhar, Suhadi, and Fatchur Rohman. "Curriculum Development for Environmental Education at an Islamic Boarding School." *Journal of Turkish Science Education* 20, no. 3 (October 1, 2023): 490–503. <https://doi.org/10.36681/tused.2023.028>.
- Masoumbeigi, H., N.M. Mohammadi, H.S. Gooshki, A. Khoshi, M. Mesri, F. Najjarzadegan, A.

- Esrafil, M. Kermani, and N. Mahmoudi. "An Approach to the Anthropological Theory of the Qur'an and Hadith and Their Roles in Reducing Environmental Degradation." *International Journal of Medical Toxicology and Forensic Medicine* 11, no. 4 (2021). <https://doi.org/10.32598/ijmtfm.v11i4.36166>.
- Mokotso, R.I. "Enhancing Religious Education Teaching and Learning for Sustainable Development in Lesotho." *HTS Teologiese Studies / Theological Studies* 80, no. 1 (2024). <https://doi.org/10.4102/hts.v80i1.9151>.
- Moneim, Y.A. "The Green Islamic Approach on Environmental Sustainability: A Contemporary Perspective." *Manchester Journal of Transnational Islamic Law and Practice* 19, no. 2 (2023): 43–68.
- Moreno-Serna, J., T. Sánchez-Chaparro, W.M. Purcell, and C. Mataix. "Driving Transformational Sustainability in a University Through Structural and Academic Innovation: A Case Study of A Public University in Spain." *Advances in Engineering Education* 10, no. 1 (2022).
- Muhammadi, M., and H.R. Haftador. "Basic Principles of Environmental Ethics in Islamic Discourse." *Advances in Environmental Biology* 8, no. 4 (2014): 947–52.
- Musa, M.N., M.I. Mokhtar, A.A. Rekan, and M.F. Zakaria. "Islamic Environmental Education: The Experience of the Institute of Islamic Understanding Malaysia (IKIM)." *Contributions to Management Science Part F* 2529 (2024): 731–41. https://doi.org/10.1007/978-3-031-48770-5_59.
- Najib, M., U. Saefullah, E. Haryanti, E. Haetami, and D.S. Maryati. "Environmental Conservation Paradigm in Islamic Ecological Perspective." *International Journal of Psychosocial Rehabilitation* 24, no. 4 (2020): 5440–47. <https://doi.org/10.37200/IJPR/V24I4/PR201640>.
- Nasr, Seyyed Hossein. *Religion & The Order of Nature*. New York: Oxford University Press, 1996. <http://archive.org/details/religionorderofnooseyy>.
- . *The Heart of Islam: Enduring Values for Humanity*. [San Francisco, Calif.]: HarperSanFrancisco, 2002. <http://archive.org/details/details/heartofislamendu0000nasr>.
- Olawumi, K.B., M.P. Mavuso, and X. Khalo. "Integrating Environmental Ethics in Teaching and Learning Through the Use of Ubuntu Principles: Review of Literature." *Journal of Culture and Values in Education* 7, no. 4 (2024): 149–71. <https://doi.org/10.46303/jcve.2024.46>.
- Opoku, M.J., and A. James. "Challenges of Teaching Akan (Ghana) Culturally-Specific Environmental Ethics in Senior High Schools: Voices of Akan IK-Holders and Biology Teachers." *Southern African Journal of Environmental Education* 36 (2020): 33–49. <https://doi.org/10.4314/sajee.v36i1.4>.
- Orr, David W. *Ecological Literacy: Education and the Transition to a Postmodern World*. Albany: State University of New York Press, 1992. <http://archive.org/details/ecologicallitera0000orrd>.
- Osuntuyi, B.V., and H.H. Lean. "Economic Growth, Energy Consumption and Environmental Degradation Nexus in Heterogeneous Countries: Does Education Matter?" *Environmental Sciences Europe* 34, no. 1 (2022). <https://doi.org/10.1186/s12302-022-00624-0>.
- Purnomo, J., S. Anantanyu, H. Saptaningtyas, and F.M. Mangunjaya. "PROPHETIC APPROACH IN ENVIRONMENTAL EDUCATION AND COMMUNITY EMPOWERMENT: A CASE STUDY OF SUSTAINABLE PESANTREN DEVELOPMENT." *Revista de Gestao Social e Ambiental* 18, no. 8 (2024). <https://doi.org/10.24857/rgsa.v18n8-047>.
- R. Rizk, R. "Islamic Environmental Ethics." *Journal of Islamic Accounting and Business Research* 5, no. 2 (2014): 194–204. <https://doi.org/10.1108/JIABR-09-2012-0060>.
- Rahman, Z. Alwi, Ilyas, A. Ilyas, Z. Darussamin, and A.G. Syafii. "SOCIO-ECO-RELIGIO-CULTURAL APPROACHES IN ADDRESSING ENVIRONMENTAL DAMAGE: AN INTERPRETATIVE ANALYSIS BASED ON THE QURAN AND HADITH." *Revista de Gestao Social e Ambiental* 18, no. 1 (2024). <https://doi.org/10.24857/RGSA.V18N1-127>.

- Rahman, N.A., F.N.M.M. Zabidi, and L. Halim. "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives." *Religions* 11, no. 8 (2020): 1–17. <https://doi.org/10.3390/rel11080394>.
- Rahmania, T. "Exploring School Environmental Psychology in Children and Adolescents: The Influence of Environmental and Psychosocial Factors on Sustainable Behavior in Indonesia." *Heliyon* 10, no. 18 (2024). <https://doi.org/10.1016/j.heliyon.2024.e37881>.
- Razumovskaya, M.I., A.A. Larionova, N.A. Zaitseva, O.A. Petrina, M.V. Vinogradova, N.G. Nagay, and O.V. Takhumova. "Models of Integrated Interactions Organization in the Field of Environmental Education." *Journal of Environmental Treatment Techniques* 7, no. 4 (2019): 576–80.
- Rini, D.K., S. Adiwibowo, H.S. Alikodra, Hariyadi, and Y.H. Asnawi. "Sustainability Indicators of Ecological Philosophy (Ecosophy) Based on the Agroecology Islamic Boarding School." *International Journal of Interdisciplinary Educational Studies* 18, no. 1 (2023): 13–34. <https://doi.org/10.18848/2327-011X/CGP/v18i01/13-34>.
- Rockström, Johan, Will Steffen, Kevin Noone, Åsa Persson, F. Stuart Chapin, Eric F. Lambin, Timothy M. Lenton, et al. "A Safe Operating Space for Humanity." *Nature* 461, no. 7263 (September 2009): 472–75. <https://doi.org/10.1038/461472a>.
- Roos, N., and E. Guenther. "Sustainability Management Control Systems in Higher Education Institutions from Measurement to Management." *International Journal of Sustainability in Higher Education* 21, no. 1 (2020): 144–60. <https://doi.org/10.1108/IJSHE-01-2019-0030>.
- Setianingrum, D.A., Setiyo, and A. Dwiyanto. "Environmental Education through Islamic Lens: Values and Practices," Vol. 482, 2024. <https://doi.org/10.1051/e3sconf/202448204014>.
- Shahida. "Green Academia: Integrating Islamic Teachings in Education for a Sustainable Future." *Journal of Islamic Thought and Civilization* 13, no. 2 (2023): 86–103. <https://doi.org/10.32350/jitc.132.06>.
- Sterling, Stephen R. *Sustainable Education: Re-Visioning Learning and Change*. Totnes: Green Books for the Schumacher Society, 2001. <http://archive.org/details/sustainableeduca000oster>.
- Sukrawati, N.M. "Maximizing Student Engagement in Hindu Education: A Study of Curriculum Content, Parental Involvement, and School Leadership Practices." *Eurasian Journal of Educational Research* 2022, no. 102 (2022): 133–52. <https://doi.org/10.14689/ejer.2022.102.008>.
- Uzorka, A., O. Akiyode, and S.M. Isa. "Strategies for Engaging Students in Sustainability Initiatives and Fostering a Sense of Ownership and Responsibility towards Sustainable Development." *Discover Sustainability* 5, no. 1 (2024). <https://doi.org/10.1007/s43621-024-00505-x>.
- Vieira, I., P. Duarte, and P. Carvalho. "ENVIRONMENTAL EDUCATION IN RETROSPECT: GENESIS AND DEVELOPMENT OF AN EDUCATIONAL MOVEMENT." *E-Revista de Estudos Interculturais* 2023, no. 11 (2023).
- Viera, Carlos Antonio. "CASE STUDY AS A QUALITATIVE RESEARCH METHODOLOGY." *Performance Improvement Journal* 62, no. 4 (March 13, 2024): 125–29. <https://doi.org/10.56811/PFI-23-0005>.
- Wakhidah, Nur, and Erman Erman. "Examining Environmental Education Content on Indonesian Islamic Religious Curriculum and Its Implementation in Life." *Cogent Education* 9, no. 1 (December 31, 2022): 2034244. <https://doi.org/10.1080/2331186X.2022.2034244>.
- Warner, K.D., A. Brook, and K. Shaw. "Facilitating Religious Environmentalism: Ethnology plus Conservation Psychology Tools Can Assess an Interfaith Environmental Intervention." *Worldviews: Environment, Culture, Religion* 16, no. 2 (2012): 111–34. <https://doi.org/10.1163/156853512X640833>.
- Yang, C.H., R. Lin, and P.-H. Lin. "Application of Experience Design in Environmental Education Experience Activities." *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes*

- in *Bioinformatics*) 12772 LNCS (2021): 251–64. https://doi.org/10.1007/978-3-030-77077-8_20.
- Ye, B., R. Yucel, Y. Qu, G. Thurston, X. Deng, I. Ryan, and S. Lin. “Impact of Environmental Programs on Student Test Scores Mediated by School Attendance Rate.” *Hygiene and Environmental Health Advances* 4 (2022). <https://doi.org/10.1016/j.heha.2022.100028>.
- Zachariou, M., A.H. Adenuga, and C. Jack. “Education and Farmers’ Environmental Performance: A Systematic Literature Review.” *Sustainability (Switzerland)* 17, no. 2 (2025). <https://doi.org/10.3390/su17020796>.
- Zeng, S., L. Wu, and T. Liu. “Religious Identity and Public Pro-environmental Behavior in China: The Mediating Role of Environmental Risk Perception.” *Religions* 11, no. 4 (2020). <https://doi.org/10.3390/rel11040165>.