

Islamic Ecopedagogy Curriculum Model in Muhammadiyah Schools

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ABSTRACT

Environmental degradation and the limited integration of ecological values in Islamic school curricula indicate a gap between Islamic environmental ethics and educational practice. While previous studies have discussed environmental awareness programs in Islamic education, few have formulated a comprehensive curriculum model that systematically integrates Islamic theological principles, ecological values, and pedagogical practices. This study aims to examine and formulate an Islamic ecopedagogy curriculum model implemented in a Muhammadiyah primary school to strengthen students' ecological awareness grounded in Islamic values. The research employed a qualitative case study design conducted at SD Muhammadiyah Slawi. Data were collected through semi-structured interviews with the principal, vice principal for curriculum affairs, six teachers, and eight students, supported by non-participant observations and document analysis of curriculum plans, school regulations, and environmental programs. Interview and observation guides were used as research instruments to ensure systematic data collection. Data were analyzed thematically using NVivo 12 through open coding, category development, and theme construction. The findings indicate that Islamic ecopedagogy functions as an integrated educational ecosystem consisting of five interrelated components: Islamic ecological values (*tauhid* and *khalifah*), curriculum integration across subjects, habituation-based environmental practices, digital ecological literacy, and environmentally friendly school culture. This study contributes a conceptual Islamic ecopedagogy curriculum model that extends previous Islamic environmental education approaches by positioning ecological values as a structural orientation of curriculum, pedagogy, and institutional culture rather than as a supplementary program. The model provides a theoretical framework for integrating Islamic ethical principles with ecopedagogical learning and offers practical guidance for developing sustainable environmental education in Muhammadiyah and other Islamic educational institutions.

Keywords: Islamic Ecopedagogy; Curriculum Model; Ecological Awareness; Islamic Education; Muhammadiyah School; Environmental Education.



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1. INTRODUCTION

Environmental degradation has become one of the most pressing global challenges of the twenty-first century, affecting ecological sustainability as well as the social, cultural, and ethical dimensions of human life. Climate change, biodiversity loss, waste pollution, and unsustainable consumption patterns demonstrate that environmental problems are not solely technical or

scientific issues but are deeply rooted in human values, behaviours, and patterns of social organization (Hakim et al., 2022; Steffen et al., 2018; Wals & Benavot, 2017). In response to these challenges, education has been widely recognised as a strategic mechanism for fostering ecological awareness and responsible environmental behaviour from an early age (Ardoin et al., 2020). However, conventional environmental education frequently emphasizes cognitive knowledge and technical problem-solving while overlooking the moral, cultural, and spiritual dimensions that shape individuals' ecological attitudes and long-term behaviour. As a consequence, learners may understand environmental problems conceptually but fail to develop a deep ethical commitment to environmental responsibility. In recent decades, ecopedagogy has emerged as an alternative educational paradigm that connects environmental education with critical pedagogy and social transformation. Rooted in the works of Freirean critical pedagogy, ecopedagogy emphasizes the interrelationship between ecological sustainability, social justice, and human consciousness (Kahn, 2010; Chang et al., 2022; Kusnanto, 2022). Rather than treating nature as an external object of study, ecopedagogy positions humans as part of an interconnected ecological system and encourages learners to critically reflect on their roles within that system. This approach shifts environmental education from knowledge transmission toward transformative learning that integrates ethical awareness, social responsibility, and active participation in ecological preservation (Misiaszek, 2020; Wals & Benavot, 2017). Nevertheless, the application of ecopedagogy in formal school curricula remains uneven, particularly in educational systems where environmental education is often treated as an additional subject rather than as an integrative framework guiding curriculum design and school culture.

Within Islamic educational contexts, ecological responsibility is not an external or newly introduced concept. Islamic teachings provide a comprehensive ethical foundation for environmental stewardship through principles such as tauhid (the unity of creation), khalifah fil ardh (human stewardship on earth), and the moral obligation to maintain balance (*mizan*) in the natural world. These theological principles emphasize that humans are entrusted with the responsibility to protect and sustain the environment rather than exploit it (Foltz et al., 2003; Nasr, 2010; Ramdhani et al., 2023). Despite this rich philosophical foundation, the integration of ecological ethics into Islamic educational practices remains limited. In many Islamic schools, environmental issues are addressed only as supplementary topics within Islamic Religious Education (PAI) or science subjects, with a strong emphasis on doctrinal knowledge rather than practical environmental engagement (Faize & Akhtar, 2020). Consequently, students often perceive environmental responsibility as separate from their religious identity rather than as an integral expression of Islamic values.

Muhammadiyah schools, as part of one of the largest Islamic educational networks in Indonesia, occupy a strategic position in responding to this challenge. Guided by the vision of Islam Berkemajuan, Muhammadiyah education seeks to integrate religious values, scientific knowledge, and social responsibility within educational practice (Dzul et al., 2023; Yosef et al., 2023). Several Muhammadiyah schools have initiated environmental programs, including Adiwiyata initiatives, green school movements, and technology-supported environmental learning activities. These initiatives demonstrate growing institutional awareness of environmental issues and reflect efforts to promote sustainable school practices. However, existing implementations often remain programmatic and fragmented. Environmental activities are frequently implemented as extracurricular initiatives or school campaigns rather than as components of a coherent curriculum framework that systematically integrates Islamic ethical values, pedagogical strategies, and environmental learning objectives.

From a curriculum perspective, this situation highlights the need to reconceptualize environmental education in Islamic schools. Curriculum should not be understood merely as a formal document describing subjects and learning objectives but as an educational ecosystem that shapes values, habits, and institutional culture (Biesta, 2015; Wals, 2020). An Islamic ecopedagogy curriculum would therefore function as a transformative framework integrating Islamic ethical principles, ecological awareness, and contextual learning practices across subjects and school activities. Through this framework, environmental responsibility can be internalized not only as knowledge but also as part of students' religious identity and daily behaviour.

Although research on environmental education and Islamic education has grown significantly in recent years, studies examining the integration of ecopedagogy within Islamic school curricula remain limited. Previous research has largely focused on environmental awareness programs, character education initiatives, or environmental campaigns within Islamic schools, yet rarely formulates a structured curriculum model grounded simultaneously in Islamic theological principles and ecopedagogical theory (Yahya & Rahmat, 2021; Faize & Akhtar, 2020). As a result, there remains a lack of conceptual frameworks explaining how Islamic ecological values can be systematically embedded within curriculum structures, pedagogical practices, and school culture. This limitation indicates a significant research gap in understanding how Islamic ecopedagogy can function as a comprehensive curriculum model rather than as a collection of environmental activities.

Responding to this gap, the present study aims to examine and formulate an Islamic ecopedagogy curriculum model implemented in a Muhammadiyah primary school. Using a qualitative case study approach conducted at SD Muhammadiyah Slawi, this research investigates how Islamic ecological values are integrated into curriculum structures, classroom learning, daily school practices, and digital learning environments (Zaini et al., 2023). Specifically, the study seeks to identify the key components of Islamic ecopedagogy and to analyse how these components interact to form a curriculum ecosystem that supports the development of students' ecological awareness and religious-ecological identity.

This study contributes to the literature in two main ways. Theoretically, it proposes a conceptual model of Islamic ecopedagogy curriculum that integrates Islamic ethical foundations with ecopedagogical learning principles and institutional school culture. Practically, it provides an empirical framework for integrating environmental education within Islamic school curricula, offering guidance for Muhammadiyah schools and other Islamic educational institutions seeking to develop sustainable, value-based environmental education. By positioning Islamic ecopedagogy as a structural orientation of curriculum rather than as an additional subject, the study expands current approaches to environmental education in Islamic schooling.

2. METHODS

This study employed a qualitative research approach with a case study design to explore and formulate an Islamic ecopedagogy curriculum model implemented in a Muhammadiyah primary school. A qualitative approach was chosen because the study sought to understand meanings, values, practices, and cultural processes underlying the integration of ecological awareness and Islamic education, rather than to measure variables quantitatively.

2.1 Research Site and Context

The research was conducted at SD Muhammadiyah Slawi, a Muhammadiyah primary school that has actively implemented environmentally oriented programs integrated with Islamic values. The school was selected purposively due to its commitment to character education, ecological awareness initiatives, and the integration of religious values into daily school practices (Pranata, 2025; Pranata & Husain, 2022). This context provided a relevant, information-rich setting for examining the implementation of Islamic ecopedagogy in a real educational environment.

2.2 Participants

The research was conducted at SD Muhammadiyah Slawi, a Muhammadiyah primary school that has actively implemented environmentally oriented programs integrated with Islamic values. The school was selected purposively due to its commitment to character education, ecological awareness initiatives, and the integration of religious values into daily school practices (Pranata, 2025; Pranata & Husain, 2022). This context provided a relevant and information-rich setting for examining the implementation of Islamic ecopedagogy in a real educational environment. A total of 16 participants were involved in this study. They consisted of one school principal, one vice principal for curriculum affairs, six teachers, and eight students who were actively engaged in environmental learning activities and school ecological programs. Participants were selected using purposive sampling, considering their roles and direct involvement in curriculum development, environmental education practices, and school sustainability initiatives.

2.3 Data Collection Techniques

Data were collected through multiple qualitative techniques to ensure depth and richness of information. First, in-depth semi-structured interviews were conducted with the principal, vice principal for curriculum affairs, teachers, and selected students. The interviews were guided by a structured interview protocol consisting of 10 core questions designed to explore participants' perspectives on the integration of Islamic values, environmental education practices, curriculum implementation, and school ecological culture. Each interview lasted approximately 30–45 minutes and was conducted in a flexible format to allow participants to elaborate on their experiences. All interviews were audio-recorded with participants' consent and later transcribed for analysis. The interviews focused on participants' understanding of ecological values in Islamic education, curriculum integration strategies, daily school practices, and perceived impacts on students' attitudes and behaviours (Rais et al., 2025). Second, a document analysis was conducted of curriculum documents, lesson plans, school regulations, and relevant Muhammadiyah educational guidelines. This analysis aimed to identify how ecological and Islamic values were formally articulated within the curriculum framework. Third, observations were conducted to examine learning activities, school routines, and environmental practices that reflected Islamic ecopedagogical principles. Observational data provided contextual insights into how values were enacted in everyday school life.

To ensure the trustworthiness of the qualitative findings, several strategies were applied following the criteria of credibility, dependability, and confirmability. Credibility was established through data triangulation by collecting information from multiple sources, including the principal, vice principal for curriculum affairs, teachers, and students, as well as through interviews, observations, and document analysis. Dependability was ensured by applying consistent research procedures during data collection and analysis, including the use of interview guides, observation checklists, and systematic coding using NVivo 12. Confirmability was

maintained by documenting all research processes, including interview transcripts, observation notes, and coding records, allowing the findings to be traced back to the original data sources and minimizing potential researcher bias.

2.4 Data Analysis Using NVivo 12

Data analysis was conducted thematically using NVivo 12 to ensure systematic, transparent, and rigorous qualitative analysis. All interview transcripts, observation notes, and documents were imported into the NVivo software as primary data. The analysis followed several stages. Initially, open coding was performed to identify significant concepts related to Islamic values, ecological awareness, curriculum practices, and school culture. Subsequently, related codes were grouped into categories through axial coding, allowing patterns and relationships among themes to emerge. Finally, overarching themes were developed to support the formulation of the Islamic ecopedagogy curriculum model.

3. RESULT AND DISCUSSION

3.1 Nodes Research

The findings of this study were generated through thematic analysis using NVivo 12, resulting in a structured set of nodes and child nodes that represent patterns of meaning emerging from interviews with teachers, students, the principal, and the vice principal for curriculum affairs. The analysis demonstrates that Islamic ecopedagogy in SD Muhammadiyah Slawi is not implemented as a single subject or isolated program, but rather as an integrated system of values, curriculum practices, school culture, and digital innovation. The following table presents the main thematic structure derived from the data, which becomes the basis for interpreting how Islamic ecological values are embedded and enacted within the school's educational ecosystem, as shown in Table 1.

Table 1. Nodes and Child Nodes of Islamic Ecopedagogy Research

No	Main Node	Child Node	Theme Description	Data Sources
1	Integration of Islamic Values in Ecopedagogy	Ecological tawhid	The environment is understood as a divine trust from God	Teachers, students
		Khalifah fil ardh	Humans as stewards and caretakers of the earth	Teachers, principal
		Cleanliness as part of faith	Religious values reflected in environmental practices	Teachers, students
2	Ecopedagogy Curriculum as an Educational Ecosystem	Curriculum integration	National curriculum, Muhammadiyah curriculum, and climate adaptation curriculum	Vice principal
		Hidden curriculum	School culture as part of curriculum implementation	Principal
3	Islamic Environmental Pedagogical Practices	Daily habituation	Class duties, cleaning routines, collective activities	Teachers, students
		Adiwiyata program	School-based environmental initiatives	School
4	Digitalization in Islamic Ecopedagogy	Digital learning media	Videos, classroom TV, interactive presentations	Teachers

No	Main Node	Child Node	Theme Description	Data Sources
5	Environmentally Friendly School Culture	Visual environmental literacy	Environmental understanding through visual media	Teachers, students
		Digital canteen	Cashless, environmentally friendly school canteen	School
		Zero waste culture	Plastic-free environmental initiatives	School
		Green canteen	Healthy and eco-friendly food services	School
		Student ecopreneurship	Environment-based economic activities	School
		Community collaboration	Teachers, staff, parents, and students collaboration	School
		Teachers as role models	Demonstrating environmentally responsible behaviour	Teachers
		Teacher collaboration	Adiwiyata team and cross-disciplinary work	Teachers
6	Teachers' Role in Ecopedagogy	Contextual pedagogical strategies	Linking learning content to environmental realities	Teachers

The findings of this study indicate that Islamic ecopedagogy at SD Muhammadiyah Slawi is implemented not as a separate subject or isolated environmental program, but as an integrated system embedded within curriculum structures, pedagogical practices, school culture, and digital innovation. In this context, ecopedagogy functions as a foundational educational orientation that shapes how the school conceptualizes the relationship between Islamic values, environmental responsibility, and learning practices (Collado et al., 2020; Ijudin et al., 2022; Lestari et al., 2024). Rather than being limited to environmental knowledge, ecological awareness is constructed through the interaction of religious values, daily practices, and institutional culture.

The analysis reveals that the Islamic ecopedagogy model implemented in the school consists of several interconnected components. The first component is the integration of Islamic ecological values, particularly tauhid, khalifah fil ardh, and cleanliness as part of faith. These principles provide the ethical foundation for environmental awareness and are translated into everyday practices rather than remaining at the level of doctrinal instruction. Teachers consistently connect environmental responsibility with religious teachings, enabling students to interpret ecological behaviour as part of their religious identity. In this sense, ecological awareness evolves not merely as cognitive knowledge but as a moral and spiritual orientation embedded within students' values and behaviour. The second component relates to curriculum integration. The findings demonstrate that ecological values are incorporated across the national curriculum, Muhammadiyah educational principles, and climate adaptation initiatives. This integration allows environmental themes to appear in multiple subjects and learning activities, reinforcing ecological awareness across learning contexts. Consistent with the concept of curriculum as an educational ecosystem, environmental values are enacted not only through formal instruction but also through routines, interactions, and institutional practices (Biswas et al., 2020; Mansouri & Hamzaoui, 2024; Rismanto et al., 2024). Within this framework, the hidden curriculum daily habits, norms, and symbolic practices—plays a critical role in internalizing ecological values.

The third component involves pedagogical practices based on habituation and experiential learning. Activities such as classroom cleaning duties, collective environmental work, and the *Adiwiyata* program provide students with concrete experiences in environmental care. These repeated practices transform environmental learning from abstract knowledge into lived experience, supporting the formation of sustainable ecological attitudes (Hadjichambis et al., 2022; Hajra & Saleem, 2021; Sumarmi et al., 2021). Through this experiential approach, environmental responsibility becomes embedded in students' daily behaviour. The fourth component is digital ecological learning. Digital tools, including videos, classroom television, and interactive presentations, are used to support environmental learning and enhance students' understanding of ecological issues. Digital systems such as the digital canteen and cashless transactions also reinforce environmentally responsible behaviour by promoting efficiency, discipline, and reduced resource consumption. These findings suggest that digitalization can function not only as an instructional medium but also as a mechanism for supporting environmentally oriented school practices (Almulla & Al-Rahmi, 2023; Anwar et al., 2022; Dahri et al., 2023).

The fifth component concerns the development of an environmentally friendly school culture. Environmental initiatives such as zero-waste campaigns, eco-friendly canteen management, student ecopreneurship, and collaborative environmental activities contribute to institutionalizing ecological values within the school community. Environmental responsibility therefore becomes a shared social practice involving teachers, students, staff, and parents.

Teachers play a central role in sustaining this system. Beyond transmitting knowledge, teachers act as role models who demonstrate environmentally responsible behaviour and connect environmental issues with real-life contexts. Through contextual teaching strategies and interdisciplinary collaboration, teachers reinforce the integration of ecological themes across subjects and learning activities (Carmichael et al., 2020; Corazza et al., 2022; Cunningham et al., 2019; Mukesh et al., 2019). This role highlights the importance of teacher agency in translating ecological values into meaningful educational experiences. Overall, the findings suggest that Islamic ecopedagogy operates as an integrated educational ecosystem in which religious values, curriculum structures, pedagogical practices, digital innovation, and school culture interact to shape students' ecological awareness. The model contributes to the literature by demonstrating that environmental education in Islamic schools becomes more effective when ecological values are embedded structurally within curriculum design and institutional culture rather than implemented as separate programs.

Despite these positive outcomes, several challenges remain. Students' behavioural consistency continues to develop, particularly when supervision is limited. Teachers also require continuous professional development to effectively integrate Islamic values, environmental education, and digital literacy within their teaching practices. In addition, alignment between school initiatives and family practices is necessary to ensure that ecological values learned at school are sustained beyond the school environment.

3.2 Interview Student Map

Figure 1 presents the Student Interview Map generated from NVivo analysis, illustrating the relationships among key themes emerging from students' experiences and perceptions of Islamic ecopedagogy practices at school. The map visualizes how students' responses are interconnected across domains of Islamic values, environmental practices, digital learning, school culture, and teacher roles. Rather than standing as isolated categories, these themes form a network of

meaning that reflects how ecological awareness is constructed through daily school experiences, religious understanding, and participatory learning environments.

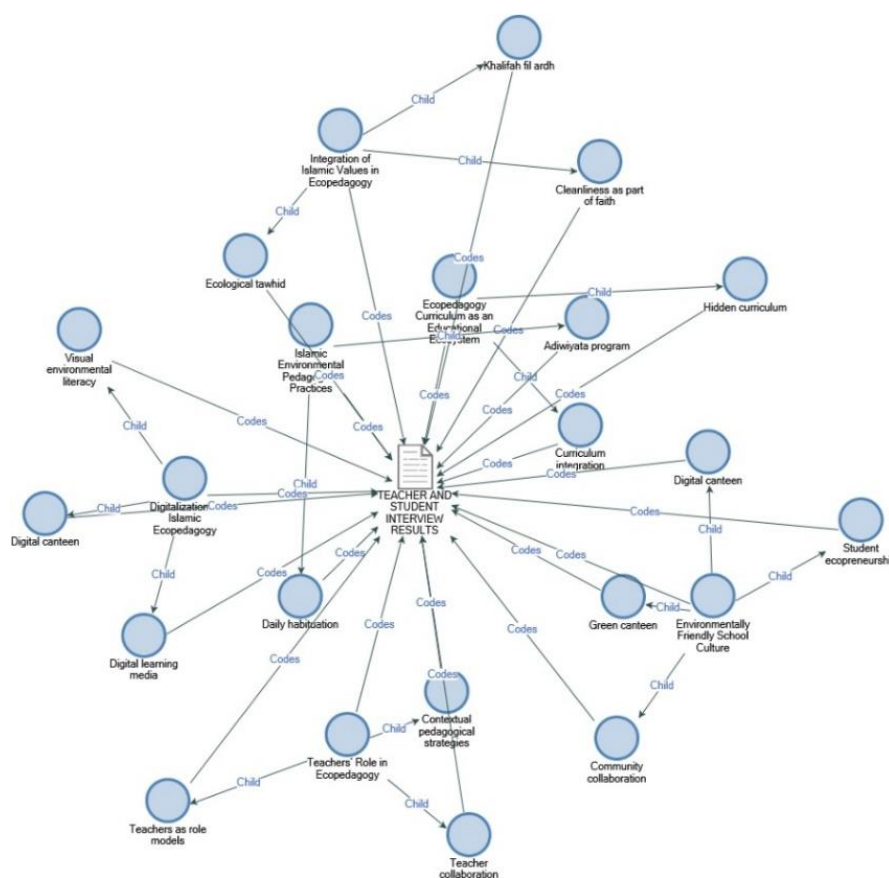


Figure 1. Interview Student Map

The analysis of student interviews indicates that ecological awareness among students is formed not solely through theoretical instruction but through the interaction of religious understanding, daily practices, and school culture. Students perceive environmental care as an integral part of their everyday experiences at school. For them, maintaining cleanliness and protecting the environment are not merely institutional rules but meaningful actions embedded in daily routines (Shah et al., 2020). One student explained that environmental activities at school involve “kegiatan untuk menjaga lingkungan sekolah agar tetap bersih,” emphasizing that environmental responsibility is understood as a collective and practical effort. Islamic values play a central role in shaping this ecological awareness. Students frequently associate environmental care with religious teachings, particularly the belief that cleanliness and environmental responsibility are integral components of Islamic practice. As one student stated, “menjaga lingkungan termasuk bagian dari ajaran Islam karena ada hadisnya,” while another emphasized that cleanliness is “sebagian dari iman.” These statements indicate that environmental behaviour is framed not only as a social norm but also as a religious obligation with moral significance. Through this perspective, ecological practices become part of students’ spiritual identity and religious responsibility (Shah et al., 2020).

Daily habituation emerges as a key mechanism in reinforcing environmental behaviour. Routine activities such as classroom duties, cleaning schedules, and collective environmental actions enable students to repeatedly practice environmentally responsible behaviour. Students describe

their actions through simple but consistent practices, including disposing of waste properly, cleaning classrooms, and carrying out scheduled duties. These repeated experiences gradually shape students' attitudes and contribute to the internalization of environmental responsibility as part of their everyday behaviour. Teachers also play an important role in reinforcing ecological awareness. Students perceive teachers not only as instructors but also as role models whose behaviour influences their own actions. Contextual teaching strategies that link classroom learning with real environmental issues help students understand and apply ecological values in practical situations (R'boul, 2021). Through consistent guidance and demonstration, teachers support the development of environmentally responsible behaviour among students.

Digital learning experiences further contribute to the development of ecological awareness. Students reported exposure to environmental learning through digital media, including videos and classroom technology, explaining that they had “pernah menggunakan TV atau handphone untuk belajar tentang lingkungan.” Visual and digital media help students understand environmental problems more concretely and increase their interest in environmental topics. In this sense, digital tools function not only as instructional media but also as facilitators of visual environmental literacy that enhance engagement and comprehension (Ebaid, 2021; Kanwal, 2024). The development of an environmentally friendly school culture is also reflected in students' experiences. Students actively participate in collective activities such as school cleaning programs, Adiwiyata initiatives, and environmental campaigns. Many students describe these activities positively, emphasizing the collaborative nature of environmental work, such as “kerja bakti karena dilakukan bersama teman-teman.” These shared activities strengthen students' sense of responsibility toward the school environment and reinforce environmental awareness through social interaction (Fiel'ardh et al., 2023).

3.3 Interview Teacher Map

Figure 2 presents the Teacher Interview Map generated from NVivo analysis, illustrating the relationships among themes emerging from teachers' experiences in implementing Islamic ecopedagogy at school. The visualisation shows how teachers conceptualise and practice integrating Islamic values, environmental education, digital learning, and school culture into their teaching. The map highlights that teachers' perspectives form a central node connecting curriculum integration, pedagogical strategies, environmental practices, and digital innovation. This indicates that teachers function as key agents in translating ecological and religious values into practical educational experiences.

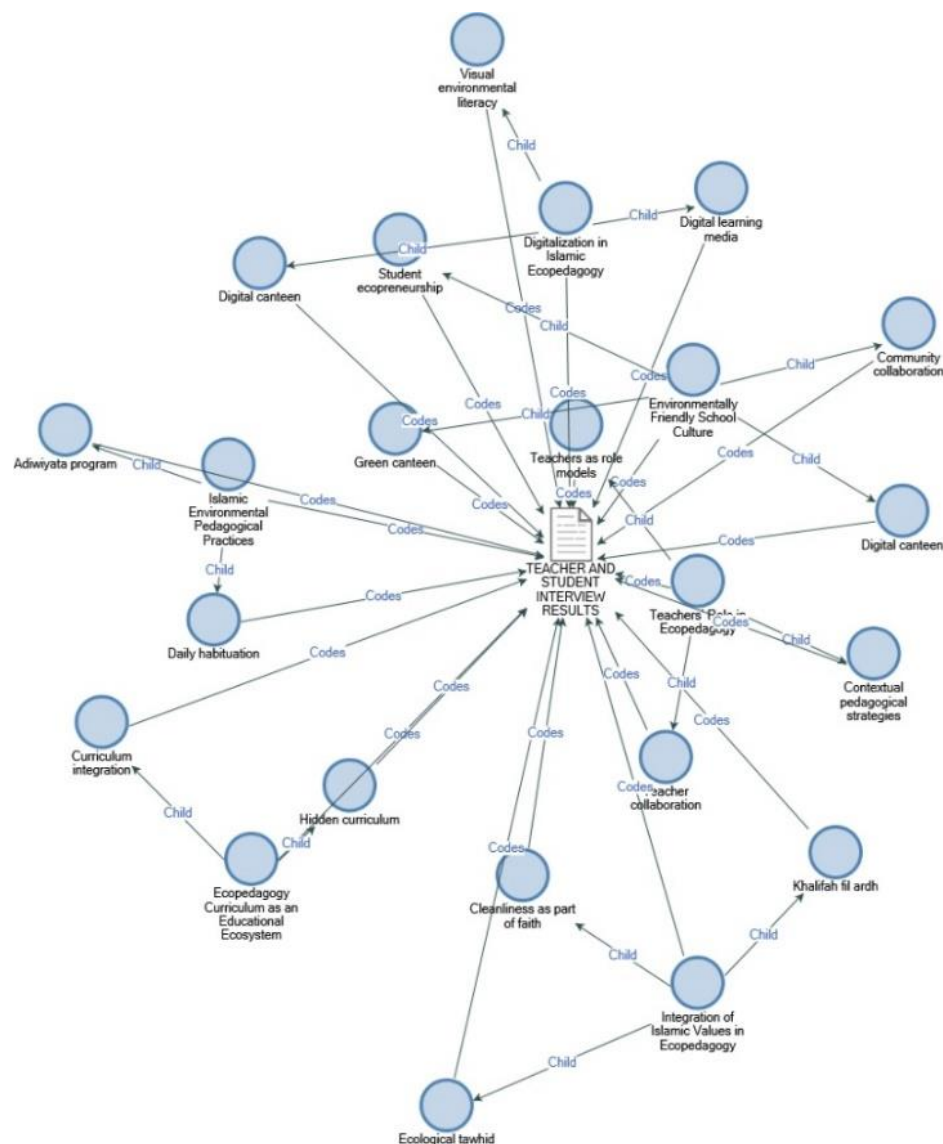


Figure 2. Interview Teacher Map

The analysis of teacher interviews reveals that Islamic ecopedagogy is implemented through a dynamic integration of religious values, pedagogical practices, digital learning, and school culture. Teachers perceive environmental education not as an additional component of instruction but as an inherent part of Islamic teaching and character formation. Environmental responsibility is framed within religious discourse, emphasizing moral accountability and spiritual awareness (Gunawan & Shieh, 2020; Naqvi et al., 2020; Zhao et al., 2021). One teacher explained that environmental care is always connected with Islamic teachings, particularly through practices such as maintaining cleanliness before worship and ensuring that prayer spaces remain clean and well-maintained.

The integration of Islamic values forms the conceptual foundation of environmental learning. Teachers consistently refer to religious principles when explaining environmental responsibility to students. Cleanliness, stewardship of the earth, and moral responsibility toward nature are positioned as expressions of faith. As one teacher expressed, environmental care is taught through the understanding that *"kebersihan merupakan sebagian dari iman,"* reinforcing the moral significance of maintaining cleanliness and environmental order. This integration indicates that

ecological awareness is not presented solely as a secular or scientific issue, but as a religious and ethical obligation.

Pedagogical practices further demonstrate how environmental education is operationalized in the classroom. Teachers incorporate environmental themes into various subjects and learning contexts (Akbarak & Kaya, 2020; Alghamdi & Alanazi, 2020; Sultmann et al., 2021). One teacher described integrating environmental content into language learning by creating sentences that address students' responsibility to dispose of waste properly. Such contextual strategies enable students to connect academic content with real-life environmental issues. Teachers emphasize that learning becomes more meaningful when it is linked to students' everyday experiences and surroundings.

Daily habituation is another central component of Islamic ecopedagogy. Teachers highlight the importance of repeated environmental practices, such as classroom cleaning routines, collective environmental activities, and participation in school programs like *Adiwiyata*. These routines function as practical learning opportunities that shape students' behaviour. Teachers observe that students gradually develop environmental awareness through repeated exposure to such activities, although consistency remains a challenge (Okougbo et al., 2021). One teacher noted that some students tend to apply environmental practices only when supervised, indicating the need for continuous reinforcement and guidance.

Digitalisation is a significant factor in supporting environmental learning. Teachers actively use digital media such as videos, interactive presentations, and classroom television to illustrate environmental issues. One teacher stated that visual media helps students understand environmental problems more clearly, explaining that without visual examples, students might not fully grasp the seriousness of environmental damage. Digital tools, therefore, enhance comprehension and engagement by presenting environmental concepts in concrete, relatable ways. In addition, digital infrastructure, such as the digital canteen, contributes to environmentally friendly practices. Teachers observe that the use of cashless systems helps reduce hygiene risks and encourages responsible consumption behaviour. This demonstrates that technology is not only used for instructional purposes but also embedded in daily school practices to reinforce ecological values.

The development of an environmentally friendly school culture is strongly reflected in teachers' perspectives. Environmental initiatives such as waste management, eco-enzyme production, and collaborative environmental programs are integrated into school routines. Teachers emphasize that these initiatives involve not only students but also staff and the wider school community. The presence of collaborative activities indicates that ecological awareness is cultivated collectively rather than individually.

Teachers also recognize their role as role models in shaping students' environmental attitudes. Their actions, consistency, and interaction with students significantly influence behavioural change. Teachers acknowledge that students tend to follow what they observe in their environment. Therefore, demonstrating environmentally responsible behaviour becomes a crucial part of the teaching process (Sabarudin et al., 2023). Teacher collaboration further strengthens the implementation of environmental programs, particularly through interdisciplinary initiatives and teamwork in environmental activities.

Despite the positive outcomes, teachers identify several challenges in implementing Islamic ecopedagogy. Behavioural consistency among students remains a primary concern, as not all students maintain environmental practices independently. Teacher readiness in integrating Islamic values, environmental education, and digital technology also requires continuous

professional development. Time constraints and varying levels of student engagement further complicate implementation.

Overall, the teacher interview map illustrates that Islamic ecopedagogy is sustained through the interaction of curriculum integration, pedagogical strategies, digital innovation, and school culture. Teachers act as mediators, translating abstract ecological and religious values into concrete learning experiences (S. & Bancong 2024). Environmental education is therefore not confined to instructional content but embedded in daily practices and institutional culture. These findings highlight that the effectiveness of Islamic ecopedagogy depends largely on teachers' capacity to integrate moral values, contextual learning strategies, and technological tools within a coherent educational framework. Through this integration, environmental responsibility becomes part of students' character formation and religious identity, reinforcing the idea that caring for the environment is an essential dimension of Islamic education and everyday life.

3.4 Interview Student-Teacher Map

Figure 3 presents the Student-Teacher Interview Map generated through NVivo analysis, illustrating the interconnected themes emerging from both student and teacher perspectives regarding the implementation of Islamic ecopedagogy at school. The visualisation demonstrates how ecological awareness is constructed through the interaction among Islamic values, pedagogical practices, digitalisation, school culture, and collaborative learning environments. The map positions teacher and student experiences as mutually reinforcing, showing that environmental education is not transmitted in a one-directional manner but formed through shared practices, daily interactions, and institutional culture.

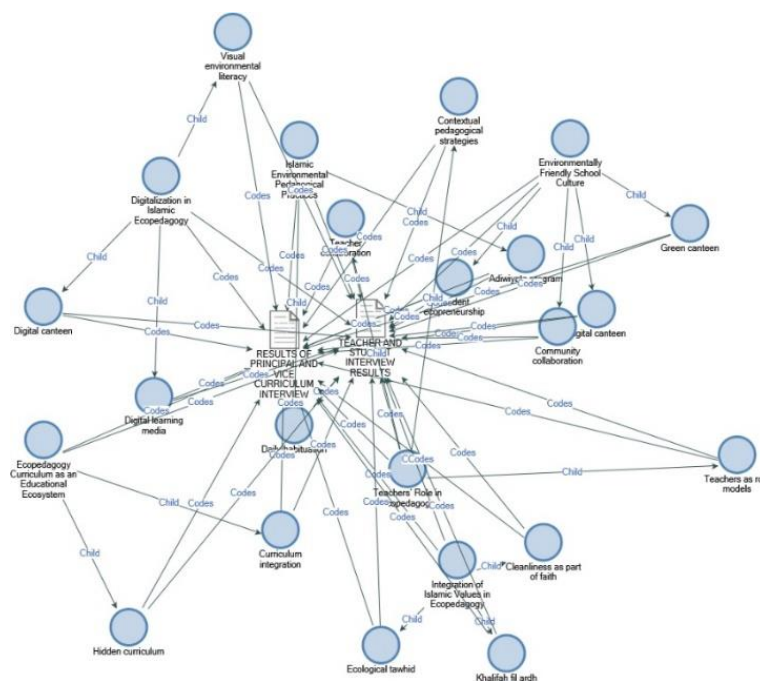


Figure 3. Interview Student-Teacher Map

The combined analysis of student and teacher interviews reveals that Islamic ecopedagogy operates as a relational process shaped by interaction between teaching practices and student experiences. Ecological awareness is not solely the product of instructional delivery but emerges

through continuous engagement between values, habits, and social participation. Teachers function as facilitators and role models, while students internalize ecological values through practice and lived experience (Faize & Akhtar, 2020; Hakim et al., 2022; Rismanto et al., 2024; Yahya & Rahmat, 2021).

The integration of Islamic values forms the central axis of this relational process. Teachers consistently frame environmental care within Islamic teachings, emphasizing that maintaining cleanliness and protecting nature are part of religious responsibility. One teacher explained that environmental practices are linked to worship activities, such as maintaining cleanliness before prayer and caring for shared spaces. This perspective is reflected in students' understanding, as they describe environmental care as part of Islamic teachings, stating that maintaining cleanliness is "sebagian dari iman" and that environmental responsibility is part of religious obligation (Kusnanto, 2022; Lestari et al., 2024; Yahya & Rahmat, 2021; Yosef et al., 2023). The convergence of teacher guidance and student perception indicates that ecological awareness is built through shared moral narratives.

Curriculum integration further strengthens this process. Teachers incorporate environmental themes into various subjects, while students experience these values through daily routines and school activities. The curriculum functions not only as a formal framework but also as a cultural environment where values are enacted. Teachers highlight the integration of environmental content across subjects and school programs, while students describe routine activities such as classroom cleaning, collective environmental programs, and participation in environmental campaigns. This alignment demonstrates that learning occurs through both structured instruction and informal practices.

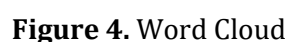
Pedagogical strategies based on contextual learning play a significant role in bridging teacher instruction and student experience. Teachers connect lesson content to real environmental conditions, encouraging students to observe and respond to their surroundings. One teacher noted that environmental learning becomes meaningful when linked to real-life situations, such as encouraging students to dispose of waste properly and to recognise environmental problems in their surroundings. Students respond to these strategies by demonstrating awareness in daily actions, explaining that they routinely "*membuang sampah pada tempatnya*" and participate in environmental maintenance activities.

Digitalisation emerges as a shared learning space that connects teachers and students. Teachers utilize digital media, including videos, classroom television, and interactive presentations, to explain environmental issues (Biswas et al., 2020; Collado et al., 2020; Hadjichambis et al., 2022; Rismanto et al., 2024). Students acknowledge that they have learned about environmental care through digital tools such as television and mobile devices. The presence of digital infrastructure, including digital learning media and digital canteen systems, reinforces environmentally responsible behaviour while promoting technological literacy. Technology thus serves as both an instructional medium and a behavioural reinforcement mechanism.

The formation of an environmentally friendly school culture is another primary outcome highlighted in the combined analysis. Environmental initiatives such as Adiwiyata programs, green canteen management, and collaborative environmental activities involve both teachers and students. Teachers organize and facilitate these programs, while students actively participate and derive meaning from them. Students describe environmental activities as enjoyable and meaningful, such as collective cleaning or environmental campaigns, suggesting that ecological awareness is reinforced through social interaction and shared experiences.

Despite the positive integration, the analysis also identifies challenges. Teachers report difficulties in maintaining students' behavioural consistency, noting that some students apply environmental practices only under supervision. Students also experience varying levels of engagement depending on the context and support provided. These challenges indicate that ecological awareness requires continuous reinforcement through both instructional and cultural mechanisms. The findings suggest that the strength of Islamic ecopedagogy lies in its integrative nature. Environmental education becomes effective when it connects religious values, contextual pedagogy, institutional culture, and digital innovation into a unified learning experience. Through this process, ecological responsibility becomes a dimension of religious identity and character formation, demonstrating that caring for the environment is not only an educational goal but also a lived expression of Islamic values in everyday school life.

Figure 4 presents the word cloud generated from interview transcripts using NVivo analysis, illustrating the frequency and prominence of key terms related to the implementation of Islamic ecopedagogy in the school context. Words such as environment, cleanliness, activities, integration, and technology are most prominent, indicating the central themes emphasised by teachers and students during the interviews. The visualisation highlights how environmental discourse in the school is closely linked to daily practices, curricular integration, and the use of digital media. This word distribution provides an overview of how ecological awareness is constructed linguistically and conceptually within the educational setting.



The word cloud analysis reveals that environmental discourse dominates the narratives of both teachers and students. Terms such as "environment," "cleanliness," and "activities" appear prominently, suggesting that environmental education is not merely theoretical but firmly embedded in everyday school practices. Teachers and students often view environmental care as a routine activity rather than an abstract concept. One teacher explained that environmental education is consistently linked to daily practices, emphasising cleanliness before worship and the maintenance of school spaces. Similarly, students described environmental care as "*kegiatan untuk menjaga lingkungan sekolah agar tetap bersih*," reflecting their understanding that environmental responsibility is part of daily life.

The prominence of the word "cleanliness" indicates that ecological awareness is closely tied to Islamic moral values. Cleanliness is framed not only as a hygienic practice but as a religious principle guiding behaviour. Teachers repeatedly connect environmental care with Islamic teachings, reinforcing the idea that "*kebersihan merupakan sebagian dari iman*." Students internalize this perspective, as shown in their statements that maintaining cleanliness and protecting the environment are part of religious obligations. This linguistic emphasis demonstrates that environmental discourse in the school is shaped by a moral-religious framework rather than purely environmental or scientific reasoning (Faize & Akhtar, 2020; Hakim et al., 2022; Ijudin et al., 2022; Zaini et al., 2023).

The frequent appearance of the word "activities" suggests that experiential learning plays a central role in the formation of ecological awareness. Environmental education is realized through participatory actions such as cleaning routines, waste management, and collaborative environmental programs. Students describe their involvement in practical terms, such as "*membuang sampah pada tempatnya*," "*melaksanakan piket kelas*," and participating in environmental campaigns. These recurring actions indicate that environmental awareness is cultivated through repeated experiences that gradually shape behaviour.

The presence of words related to "integration" and "curriculum" highlights that environmental education is systematically embedded within the educational structure. Teachers integrate environmental themes across subjects and school programs, reinforcing ecological values through multiple learning contexts. One teacher explained that environmental topics are integrated into different lessons and daily routines, so students perceive them as part of normal learning rather than separate content. This integrated approach strengthens the continuity between knowledge and practice (Almulla & Al-Rahmi, 2023; Biswas et al., 2020; Rismanto et al., 2024).

Technology-related terms such as "digitalization," "media," and "technology" also appear prominently, indicating the growing role of digital tools in environmental education. Teachers use videos, presentations, and classroom technology to illustrate environmental issues and make learning more engaging. One teacher noted that visual media help students understand environmental problems more clearly, especially when showing real examples of environmental damage. Students confirmed this experience, stating that they had learned about environmental care through television and digital devices used in class. The presence of digital systems, such as a digital canteen, further demonstrates how technology shapes environmentally responsible behaviour through everyday school practices.

The appearance of terms related to "collaboration" and "community" suggests that environmental education is supported by collective participation. Teachers, students, and school staff work together in environmental programs, creating a shared sense of responsibility. Students describe environmental activities as enjoyable and meaningful when carried out

together, such as participating in collective cleaning or environmental campaigns. This collaborative environment strengthens ecological awareness by embedding it within social interaction and group participation (Almulla & Al-Rahmi, 2023; Biswas et al., 2020; Naqvi et al., 2020; Rismanto et al., 2024; Shah et al., 2020; Yunus et al., 2024).

Furthermore, the word cloud reflects the presence of institutional support and organizational involvement. References to Muhammadiyah, programs, and educational initiatives indicate that environmental education is supported at the organizational level. Teachers acknowledge that school policies, environmental programs, and curriculum frameworks contribute to the sustainability of ecological initiatives. This institutional dimension reinforces the idea that environmental education is not limited to individual efforts but is embedded within systemic educational planning.

Overall, the word cloud analysis demonstrates that Islamic ecopedagogy in the school is constructed through a combination of values, practices, and institutional structures. Environmental discourse is strongly associated with religious values, daily activities, and technological support (Hajra & Saleem, 2021; Zaini et al., 2023). The repetition of key terms underscores a consistent emphasis on environmental responsibility throughout school life. These findings suggest that ecological awareness develops through linguistic reinforcement and experiential learning. The frequent use of terms related to environment, cleanliness, and activities indicates that environmental education is embedded in both communication and practice. Teachers introduce and reinforce these values through instruction and modeling, while students internalize them through participation and repetition.

3.6 Word Frequency

Table 2 presents the results of a word-frequency analysis of interview transcripts, derived using NVivo, highlighting the most dominant terms in discussions with teachers and students regarding Islamic ecopedagogy practices. The frequency and weighted Percentage of each word indicate the central issues emphasized by participants, particularly those related to environmental awareness, cleanliness, curriculum integration, technology use, and institutional identity. This table provides an analytical overview of how environmental discourse is constructed linguistically and conceptually within the school context.

Table 2. Word Frequency

Word	Length	Count	Weighted Percentage (%)
Environmental	13	88	004
Environment	11	60	002
Activities	10	41	002
Cleanliness	11	26	001
Muhammadiyah	12	18	001
Protection	10	14	001
Technology	10	14	001
Applications	12	13	001
Curriculum	10	12	000
Protecting	10	12	000
Elementary	10	11	000
Integration	11	9	000

Word	Length	Count	Weighted Percentage (%)
Integrated	10	8	000
Integrating	11	7	000
Environmentally	15	6	000
Maintaining	11	6	000
Application	11	5	000
Presentations	13	5	000
Adaptation	10	4	000
Collaboration	13	4	000

The word frequency analysis indicates that environmental discourse is the most dominant theme emerging from the interview data. Terms such as environment and environmental appear most frequently, suggesting that ecological awareness forms the central focus of both teacher and student narratives. Environmental education is consistently embedded in learning activities and daily school practices. Teachers associate environmental learning with routine practices such as maintaining cleanliness and caring for the school surroundings, while students interpret environmental activities as practical efforts to keep the school environment clean and healthy (Chang et al., 2022; Mansouri & Hamzaoui, 2024; Shah et al., 2020; Sumarmi et al., 2021). The prominence of the terms activities and cleanliness further indicates that ecological learning is grounded in habitual and experiential practices. Environmental education is implemented through routine activities such as classroom duties, collective cleaning, and participation in environmental programs. Students frequently describe their involvement in these activities through statements such as “membuang sampah pada tempatnya” and “melaksanakan piket kelas sesuai jadwal.” These repeated practices demonstrate that ecological awareness develops through continuous participation in structured activities rather than through theoretical instruction alone.

The analysis also highlights the influence of Islamic values and institutional context in shaping environmental education. The frequent appearance of the terms cleanliness and Muhammadiyah reflects the integration of religious teachings and institutional identity in environmental learning. Teachers often connect environmental care with Islamic principles, emphasizing that maintaining cleanliness is part of religious responsibility. As a Muhammadiyah school, environmental initiatives are aligned with Muhammadiyah educational principles that emphasize character education and social responsibility (Naqvi et al., 2020; Yunus et al., 2024). In addition, technology-related terms such as technology, applications, and presentations indicate the role of digital tools in supporting ecological learning. Teachers utilize digital media to present environmental issues visually and contextually, enabling students to better understand environmental problems and participate more actively in learning activities (Almulla & Al-Rahmi, 2023; Biswas et al., 2020; Collado et al., 2020).

4. CONCLUSION

This study examined and formulated an Islamic ecopedagogy curriculum model implemented in a Muhammadiyah primary school to foster ecological awareness grounded in Islamic values. The findings demonstrate that Islamic ecopedagogy operates not as a separate environmental subject but as an integrated educational ecosystem that connects Islamic ethical values, curriculum structures, pedagogical practices, school culture, and digital innovation. Ecological awareness among students develops through the interaction of religious teachings, daily

habituation, participatory environmental activities, and institutional support within the school environment.

The study contributes theoretically by proposing a conceptual model of Islamic ecopedagogy curriculum that integrates Islamic ecological values—such as tauhid, khalifah fil ardh, and cleanliness as part of faith—with ecopedagogical learning principles and institutional school culture. Unlike previous approaches that treat environmental education as a program or extracurricular initiative, this model positions ecological values as a structural orientation embedded within curriculum design, pedagogical practices, and school culture. This integrative framework highlights the role of religious values, experiential learning, digital support, and teacher leadership in shaping students' ecological awareness and behaviour.

Despite these contributions, the study has several limitations. The research was conducted in a single Muhammadiyah primary school, which may limit the generalizability of the findings to other educational contexts. In addition, the study relied primarily on qualitative data, which provides in-depth insights but does not measure the long-term impact of the curriculum model on students' environmental behaviour. Future research is therefore recommended to examine the implementation of Islamic ecopedagogy across different Islamic educational institutions and educational levels. Quantitative or mixed-method studies could also be conducted to evaluate the effectiveness of the model in improving students' ecological attitudes, behaviours, and environmental literacy. Further investigation into the role of community and family engagement in strengthening ecological values beyond the school environment would also contribute to the development of sustainable Islamic environmental education.

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