

## **Integrating Islamic Values into Natural Science Education to Foster Environmental Awareness: A Systematic Literature Review**

**Anip Dwi Saputro<sup>\*1</sup>**, **Devid Dwi Erwahyudin<sup>2</sup>**, **Sigit Dwi Laksana<sup>3</sup>**, **Adib Khusnul Rois<sup>4</sup>**

<sup>1,2,3</sup>Universitas Muhammadiyah Ponorogo, Indonesia

Author Correspondence: [aipdwisaputro@umpo.ac.id](mailto:aipdwisaputro@umpo.ac.id)

**Received:** 2025-06-18; **Revised:** 2025-10-13; **Accepted:** 2025-11-09; **Published:** 2025-12-24

**How to cite:** Saputro, A. D., Erwahyudin, D. D., Laksana, S. D., & Rois, A. K. (2025). Integrating Islamic Values into Natural Science Education to Foster Environmental Awareness: A Systematic Literature Review. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 15(2), 257–271. <https://doi.org/10.18592/aladzkapgmi.v15i2.17182>

This is an Open Access article distributed under the terms of the [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

**Abstract:** Natural science education plays a critical role in shaping students' understanding of the natural world and their responsibility toward environmental sustainability. Within faith-informed educational contexts, science learning is increasingly viewed not only as an empirical endeavor but also as a medium for ethical and spiritual reflection. This study aims to synthesise existing research on the integration of Islamic values into natural science education in fostering environmental awareness among elementary school students through a Systematic Literature Review guided by the PRISMA 2020 framework. Relevant studies published between 2018 and 2024 were systematically identified, screened, and analysed using a thematic synthesis approach. The findings indicate that the integration of Islamic ethical principles, including stewardship, responsibility, balance, and care for cleanliness, is consistently associated with enhanced environmental awareness at cognitive, affective, and spiritual levels. Integrated thematic learning, contextual instruction grounded in Qur'anic reflection, and experiential activities are widely reported as supportive pedagogical strategies. This review contributes a consolidated conceptual reference for values-informed science education and highlights directions for future empirical research on sustainable environmental learning in primary education contexts.

**Keywords:** Islamic Education, Natural Science, Environmental Awareness, Elementary School, Integrated Learning

**Abstrak:** Pendidikan ilmu pengetahuan alam memainkan peran kritis dalam membentuk pemahaman siswa tentang dunia alam dan tanggung jawab mereka terhadap keberlanjutan lingkungan. Dalam konteks pendidikan yang didasarkan pada keyakinan agama, pembelajaran ilmu pengetahuan tidak hanya dipandang sebagai upaya empiris, tetapi juga sebagai sarana refleksi etis dan spiritual. Studi ini bertujuan untuk mensintesis penelitian yang ada tentang integrasi nilai-nilai Islam ke dalam pendidikan ilmu pengetahuan alam dalam meningkatkan kesadaran lingkungan di kalangan siswa sekolah dasar melalui tinjauan literatur sistematis yang dipandu oleh kerangka kerja PRISMA 2020. Studi-studi relevan yang diterbitkan antara tahun 2018 dan 2024 diidentifikasi, disaring, dan dianalisis secara sistematis menggunakan pendekatan sintesis tematik. Temuan menunjukkan bahwa integrasi prinsip etika Islam, termasuk tanggung jawab, keseimbangan, dan kepedulian

*terhadap kebersihan, secara konsisten terkait dengan peningkatan kesadaran lingkungan pada tingkat kognitif, afektif, dan spiritual. Pembelajaran tematik terintegrasi, pengajaran kontekstual yang didasarkan pada refleksi Al-Qur'an, dan aktivitas pengalaman dilaporkan secara luas sebagai strategi pedagogis yang mendukung. Tinjauan ini memberikan acuan konseptual yang terpadu untuk pendidikan sains yang berorientasi nilai dan menyoroti arah penelitian empiris masa depan tentang pembelajaran lingkungan berkelanjutan dalam konteks pendidikan dasar.*

**Kata Kunci:** Pendidikan Islam, Ilmu Pengetahuan Alam, Kesadaran Lingkungan, Sekolah Dasar, Pembelajaran Terpadu

## Introduction

Education is the primary means of shaping the character and insight of students, thereby playing a significant role in the development and progress of society (Ulu & Kiraz, 2014). Education serves to develop abilities and create dignified human beings, cultivate personality, and foster a dignified national civilization by educating and nurturing the nation's life (Nurdyansyah & Arifin, 2018). Environmental education emerges when humans recognize the need to correct the environmental distortions they have caused through their attempts to dominate nature (Sukma et al., 2020). According to Ramadhani et al. (2020), the dichotomy of science influences the development of science by shaping how people think and perceive the world. On the one hand, there is a group of people who study general or modern science, which has minimal religious values, and therefore view individuals who deepen their knowledge of religion as being separated from the progress of general science.

The view of the contradictory relationship between the two may stem from the fact that religion often perceives a problem from a normative perspective. At the same time, science examines it from an objective perspective, namely, how it is (Saripudin, 2018). Science is like two blades that can be combined to become anything. So religion is present as a controller and a proper reference. For this reason, Islam does not recognize the dichotomy of knowledge, because science and religion actually complement each other (Machsun et al., 2020). Islam is a religion that is in accordance with human nature, so its sharia not only encourages humans to study science, but also to build and foster civilization; it even directs its people in that direction so that they are safe and saved both in this world and in the afterlife (Zain & Vebrianto, 2017).

Quality science education aims to produce science-literate students with the long-term goal of creating responsible citizens who are equipped with relevant science knowledge and skills (Kumar et al., 2023). Learning with scientific literacy encourages students to participate in learning activities and increases their curiosity, as they have the opportunity to discover and apply science in everyday life. In the context of Islamic education, natural science (IPA) is understood not only as worldly knowledge but also as a reflection of Allah's greatness. The integration of natural science education and Islamic values in Elementary Schools is important, as it enables students not only to understand scientific concepts but also to develop spiritual awareness in observing natural phenomena (Nuzula & Sudibyo, 2022).

Islamic education, as stated by Prasetyo and Ahmad (2020), is fundamentally an effort to nurture and develop human potential. This education aims to fulfill the purpose of one's existence in this world as a servant of Allah, while simultaneously fulfilling the responsibilities of being Allah's caliph to the best of one's ability. The potential in question encompasses both physical potential and spiritual potential, including reason, feelings, will, and other aspects of spiritual potential. In the history

of Islam, numerous Muslim scientists have developed scientific knowledge in accordance with Islamic teachings. Figures such as Al-Farabi, Ibn Sina, and Al-Khwarizmi have demonstrated that science and religion can coexist harmoniously. They developed science as a means to understand the creation of Allah the Almighty. Therefore, natural science education integrated with Islamic teachings aims not only to improve students' scientific literacy but also to foster a more comprehensive and profound way of thinking.

In addition, this approach also fosters critical attitudes and curiosity in students towards the natural phenomena around them. By connecting scientific concepts with verses of the Qur'an, students can understand that science and religion are not separate, but rather complement each other. Islamic-based science education can effectively foster ecological awareness among students by encouraging them to protect and preserve the environment as a part of their worship of Allah SWT. As times change, the education curriculum increasingly emphasizes the integration of various disciplines, including both science and religion. Aligns with the concept of Islamic education, which emphasizes not only academic aspects but also moral and spiritual aspects. Therefore, strengthening the integration between science and Islam in Elementary Schools is an effective strategy for producing a generation that is not only intellectually intelligent but also has a strong character and is grounded in Islamic values.

In today's modern era, various environmental issues, including climate change, air and water pollution, forest destruction, soil degradation, and the biodiversity crisis, are increasingly becoming a real threat to human survival, thus demanding collective and systematic efforts from all elements. A crucial aspect is cultivating a generation that possesses ecological awareness and a sense of responsibility for nature conservation. In this context, elementary schools, as the initial foundation of formal education, have a very strategic role in instilling the values of environmental awareness through a learning process that not only emphasizes cognitive aspects but also fosters the affective and spiritual dimensions of students.

One of which is by integrating Islamic Religious Education and Natural Sciences. As an approach that is not only conceptual and scientific, but also touches moral awareness and divine values, where Islamic teachings contained in the Qur'an and Hadith explicitly or implicitly teach ecological principles such as the importance of maintaining the balance of nature (*mīzān*), the prohibition of doing earth damage (*fasād*), and human responsibility as *khalifah fil ardh* (caretaker of the Earth), which when combined with science material about ecosystems. The study of the water cycle, pollution, and nature conservation will enhance students' understanding of the interconnected relationship between humans and the environment. This learning experience not only engages the mind but also resonates emotionally, shaping positive behaviors. It encourages students to internalize religious values and apply them in their daily lives, particularly in the effort to maintain and preserve the environment as a collective responsibility and act of worship.

Previous studies have explored the integration of Islamic values into education, particularly in the areas of moral and character development (Nurdyansyah & Arifin, 2018; Kasmawati et al., 2023). Several researchers have also examined the connection between Islamic teachings and scientific concepts to promote students' understanding of nature and environmental care (Ramadhani et al., 2020; Rokhman & Amami, 2021). However, most of these studies are limited to qualitative case studies or conceptual analyses focusing on specific schools or subjects. There have been limited studies that systematically review and synthesize the existing literature on how Islamic values are integrated into Natural Science learning to foster

environmental awareness at the elementary school level. Moreover, previous works have not comprehensively mapped the implementation models, learning outcomes, and pedagogical strategies used in this integration. Despite these growing discussions, a comprehensive synthesis that systematically examines how Islamic values are integrated into natural science education to foster environmental awareness at the elementary level remains limited.

Although research on values-based education and environmental awareness in primary schooling has expanded in recent years, the integration of religious values within science education remains insufficiently synthesised, particularly in relation to environmental awareness outcomes. Existing studies tend to be dispersed across conceptual analyses and small-scale qualitative investigations, offering limited cumulative insight into how ethical and spiritual dimensions are pedagogically embedded within natural science learning. Addressing this gap, the present study provides a systematic and thematic synthesis of the literature through a PRISMA-guided systematic review, examining how Islamic values are operationalised within elementary science education and how such integration is associated with students' environmental awareness across cognitive, affective, and spiritual domains. By consolidating fragmented evidence into an integrative analytical framework, this review contributes to broader international discussions on holistic science education and values-informed environmental learning in primary education contexts

## Method

### 1. Research Design

This study employed a *Systematic Literature Review* (SLR) approach guided by the PRISMA 2020 framework (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The use of PRISMA aimed to enhance transparency and methodological clarity in identifying, screening, and synthesising relevant studies concerning the integration of Islamic values into natural science education for fostering environmental awareness among elementary school students. This review focused on qualitative and *thematic synthesis* rather than quantitative meta-analysis, as the selected studies predominantly employed descriptive and conceptual research designs.

### 2. Literature Search Sources and Strategy

The literature search was conducted across six international and national academic databases, selected to represent both global scientific visibility and local Islamic education discourse, as presented in Table 1.

**Table 1. Literature Search Sources and Rationale**

No	Database	Access Type	Scope	Relevance to Study
1	Scopus	Subscription	Education, environmental studies	Provides internationally indexed and peer-reviewed studies
2	ERIC	Open access	Education	Focused on school-based and pedagogical research
3	Google Scholar	Open access	Broad	Captures grey literature and regional journals
4	DOAJ	Open access	Education & religion	Identifies quality open-access journals
5	SINTA	Open access	National education & Islamic studies	Represents Indonesian scholarly perspectives

The search process utilised Boolean operators with key terms including “Islamic values” OR “Islamic education” AND “natural science education” OR “science learning” AND “environmental awareness” OR “environmental education” AND “elementary school” OR “primary education”, along with their Indonesian equivalents. The search was limited to articles published between 2018 and 2024 in order to reflect recent developments in integrative education and environmental awareness within contemporary curricular contexts.

### 3. Inclusion and Exclusion Criteria

Study eligibility was determined using predefined criteria, as summarised in Table 2.

**Table 2. Inclusion and Exclusion Criteria**

Category	Criteria	Rationale
Inclusion	Peer-reviewed journal articles	Ensures academic credibility
	Focus on elementary/primary education	Aligns with research objectives
	Explicit integration of Islamic values and science	Matches conceptual scope
	Published 2015–2024	Maintains relevance
	English or Indonesian language	Covers global and regional literature
Exclusion	Opinion papers, blogs, non-academic sources	Avoids methodological bias
	Purely theological studies	Excludes non-educational discourse
	Higher education-only studies	Outside research focus
	Incomplete full-text articles	Prevents analytical gaps

### 4. PRISMA-Based Study Selection Process

The article selection process followed four PRISMA stages: Identification, Screening, Eligibility, and Inclusion, as outlined in Table 3.

**Table 3. PRISMA Selection Stages**

PRISMA Phase	Activity	Number of Articles	Description
Identification	Initial database search	486	Articles retrieved using keyword strategy
Screening	Duplicate removal and abstract screening	162	Irrelevant and duplicate articles excluded
Eligibility	Full-text assessment	54	Evaluated using inclusion–exclusion criteria
Included	Final synthesis	12	Analysed thematically

To situate the findings of this review within the broader academic discourse, Table 4 summarises key scholarly contributions addressing the integration of Islamic values and natural science education, highlighting their focus, methodological approaches, and identified limitations

**Table 1. Recapitulation of Research Article**

Author(s)	Focus	Educational Context	Method	Key Findings	Limitations
Nurdyansyah & Arifin (2018)	Integration of Islamic values in elementary education	Islamic elementary schools (Indonesia)	R&D	Development of integrated learning models strengthens moral awareness alongside cognitive achievement	Limited focus on environmental dimensions



Ramadhani et al. (2020)	Integration of Islamic values in science learning	Elementary schools	Qualitative case study	Qur'anic-based science integration enhances students' spiritual reflection and environmental responsibility	Context-specific, limited generalisability
Rokhman & Amami (2021)	Integration of Islamic Religious Education and science	Elementary schools	Qualitative	Emphasises teacher role in linking scientific concepts with Islamic ethics	Lacks measurement of behavioural outcomes
Mansir (2022)	Islamic science integration in digital era	Islamic schools	Qualitative	Contextual strengthens internalisation	learning value Environmental awareness not explicitly measured
Suciati et al. (2022)	Student perceptions of Islam-science integration	Islamic education institutions	Quantitative survey	Positive perceptions toward integrated learning frameworks	Conducted outside elementary level
Istiana et al. (2020)	Environmental responsibility in science education	Primary education	Quantitative	Interactive media improves environmental awareness	Limited integration of religious values
Basri & Abdullah (2024)	Curriculum integration in Islamic elementary schools	Integrated Islamic schools	Qualitative	Curriculum integration supports character and value formation	Lacks empirical classroom validation
Bujuri (2024)	Development of Islamic-based science teaching materials	Elementary education	R&D	Teaching materials support contextual and values-based learning	Short-term implementation only
Firdaus (2024)	Environmental awareness through Islamic education	Primary education	Qualitative	Islamic curriculum contributes to environmental ethics aligned with SDGs	Conceptual focus, limited practice data
Ludiya (2024)	Experiential learning for environmental awareness	Elementary schools	Qualitative	Experiential strategies increase student motivation and awareness	Small sample size
Ali Wafa (2023)	Integration of religion and science	Islamic education	Conceptual analysis	Ethical integration enhances moral reasoning	No empirical testing
Aprison & Junaidi (2022)	Religious values in science discourse	Education studies	Conceptual review	Science-religion integration supports holistic education	Lacks classroom application

As indicated in Table 4, existing studies predominantly address partial aspects of Islamic values integration or environmental education in isolation. This systematic review advances the literature by synthesising these fragmented findings into a coherent integrative framework that explicitly links Islamic ethical principles with environmental awareness in elementary science education

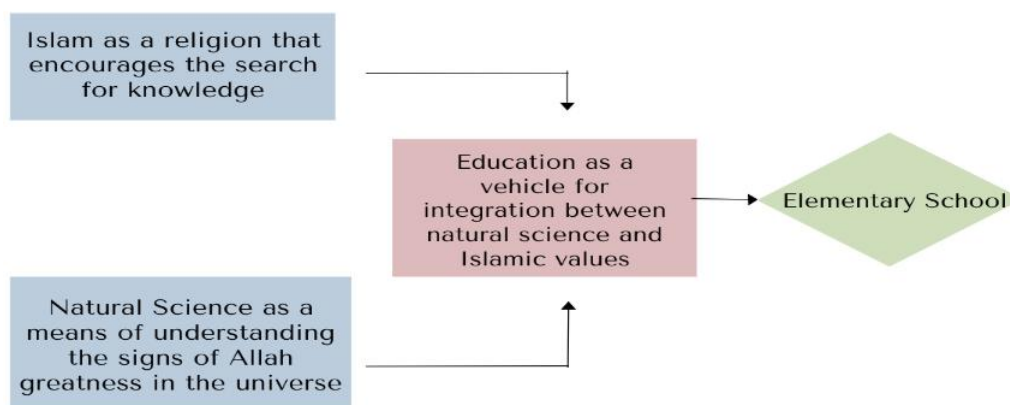
## Result and Discussion

### 1. The Concept of Integration Between Science and Islamic Education

Integration is a term that has been used by Western and Islamic philosophers, as a bridge of integration between religion and science, for example, *Amin* with the term "interconnected", *Auda* with the term "interrelatedness", *Knott* with the term "Rapprochement", *An-Naim* with the term "Reciprocity" and *Al-Jabriri* uses the term

"*irfani*", to bridge the terms between *bayani* and *burhani* (Salim & Mukhibat, 2020). The integration of science and Islam rests on the understanding that scientific knowledge represents the manifestations of Allah greatness (Machsun et al., 2020). The Qur'an contains numerous verses that discuss natural phenomena, including the Earth's rotation, the water cycle, and the creation of living beings. By connecting the concept of science with the verses of the Qur'an, students can understand that science and religion are not separate entities, but rather complementary aspects of a unified worldview. In addition, students not only gain a rational understanding of natural phenomena but also develop a spiritual awareness that everything that happens in the universe is a manifestation of Allah's greatness and order. Within this approach, science is conceived not as an autonomous discipline but as an integral manifestation of Allah's power, as articulated in the Qur'an, which encourages humankind to engage in reflection, observation, and the pursuit of knowledge through the study of the divine laws governing nature (Ramadhani et al., 2020).

This integration allows students to study scientific phenomena such as the process of human creation explained in modern embryology, which is in line with the word of Allah in Surah Al-Mu'minun, verses 12-14, or the law of gravity that regulates the balance of objects on Earth as implied in Surah Ar-Rahman, verses 7-8. Thus, science learning does not focus solely on the cognitive aspect, but also instills the values of monotheism, the importance of knowledge as a means of worship, and responsibility in managing nature in accordance with the principles of sustainability taught in Islam. Educators operationalize the concept of integration within instructional practices by employing experimental methods, conducting empirical observations of natural phenomena (Zain & Vebrianto, 2017; Sutiana & Nugraha, 2025), and engaging in faith-based reflective activities. Through these pedagogical strategies, they encourage students to interpret the harmony and order of the natural world as empirical manifestations of Allah's existence and omnipotence as the Supreme Creator. For example, in studying the water cycle, students not only understand how the processes of evaporation, condensation, and precipitation occur, but are also invited to reflect that rain is one form of Allah's grace for life, as mentioned in Surah Az-Zumar: 21. By implementing this concept, education is not only oriented towards academic achievement, but also forms the character of students to become Muslim scientists who have noble morals, have a high curiosity, and understand that the knowledge they learn must be used for the welfare of the people and as a form of devotion to Allah. The Integration of science and Islam in Islamic elementary schools is a crucial foundation for building a generation that balances intellectual, spiritual, and moral intelligence, enabling them to face the challenges of the times while adhering to Islamic values.



**Figure 1. Integration Between Natural Science and Islamic Education**

Islamic Religious Education must actively collaborate with other fields of science to comprehensively develop the potential of the Muslim community (Sutiana & Nugraha, 2025). Scholars seeking to understand the epistemology of Islam today must emphasize the interconnectedness of all forms of knowledge, which are intrinsic to the Qur'an. Linking the concept of natural science with Islamic teachings is an integrative effort that aims to show that science and religion are not two contradictory things, but rather complement each other in providing a more comprehensive understanding of the universe and human life, where Islam as a religion that encourages its followers to seek knowledge, has provided many scientific signs in the Qur'an that are in line with the findings of modern science.

In its implementation, students not only understand scientific concepts logically and empirically, but also have a stronger belief that every phenomenon in nature is proof of Allah's power, which can increase their piety, curiosity, and moral responsibility in using science for the good of the people and maintaining the balance of nature in accordance with Islamic principles.

## **2. Implementation of Learning in Elementary Schools**

Natural science is an important subject that students should master in today's era of technological and information advancement (Haqiqi, 2018). Thus, mastery of the subject of science is something that students cannot avoid in the educational process. The implementation of natural science and Islam in elementary schools is an activity that connects scientific concepts with Islamic values, thus creating an integrated learning experience for students. Three factors influence the quality of education in elementary schools: students (raw input), learning facilities (instrumental input), and the learning environment (environmental input) (Anif et al., 2020). Therefore, the teaching methods employed with students are diverse, with formal lecture lessons complemented by various activities that aim to increase their motivation and interest in science subjects (Siew-Eng et al., 2015). In this context, science is taught not only as a collection of theories and empirical experiments but also as a manifestation of the signs of Allah's greatness that must be studied, understood, and utilized for the benefit of humanity.

Natural science and religion are not two separate entities, but rather complement each other in building a civilization based on the values of monotheism. The implementation of integrating science and Islam in elementary school learning also aims to shape students' character, fostering a love for science, a high curiosity, and a sense of responsibility in applying knowledge for the greater good. This approach enhances the quality of science learning. It fosters students' awareness to apply science with ethical and moral responsibility, in line with Islamic teachings that regard the pursuit of knowledge as an act of worship to Allah (Ali Wafa, 2023).

The development of natural science learning media based on an ethnoscience approach is one way to create a learning atmosphere and learning experience that integrates religion in the learning process (Setiawan et al., 2017). The learning environment in schools plays a crucial role in shaping character. The active involvement of teachers, positive interactions between students, and an approach grounded in Islamic values collectively create an atmosphere that supports character formation (Kasmawati et al., 2023). Educators can integrate science and Islam in elementary schools through various instructional methods, including:



### a. Experiment and Reflection on Faith

Experiments in science learning not only serve to prove scientific theories and concepts, but can also be a means of reflection of faith for students by showing the order, beauty, and complexity of the universe as evidence of the greatness of Allah, where every experimental result, such as the process of photosynthesis, which enables plants to produce oxygen; the law of gravity, which maintains the balance of the Earth; and the changes in the state of water that illustrate the cycle of life. It can be linked to the Qur'an, which explains natural phenomena, so that students not only understand science empirically, but also increasingly realize that science is part of the signs of Allah's power that must be studied, appreciated, and utilized with full responsibility as a form of worship and gratitude. Experiments aim to teach children science content knowledge, practice science process skills involved in investigating scientific principles and designing artificial facts, and cultivate their curiosity (Kahmann et al., 2024). In this context, educators encourage students to conduct simple experiments, such as growing plants, and relate their observations to the Islamic concept of creation.

**Table 2. Experimental Activities**

Activity	Purpose	Integration
Photosynthesis Experiment and the Miracle of Sunlight	Understanding the process of photosynthesis is the basis of life on Earth. Instilling awareness that the sun and plants are gifts from Allah to human life.	The teacher connected this phenomenon with the Qur'an, such as in Surah Yasin: 80, which explains that Allah created plants that can store energy.
Water Cycle Experiment	Understand how water changes form and its role in the ecosystem. Strengthen the belief that the water cycle is a form of order that Allah has determined for human life.	The teacher explains verses related to the water cycle, such as in Surah Az-Zumar: 21, which describes how Allah sends rain as a source of life.
Experiment on Gravity and Natural Order	Understanding the concept of gravity as a universal law of nature. Realizing that order and balance in nature are evidence of Allah greatness.	Connects this experiment with verses from the Koran, such as in Surah Ar-Rahman:7-8, which explain the balance that Allah created in the universe.
Experiments on Changing the State of Substances	Understand the concept of changes in the state of matter in everyday life. Linking the orderliness of natural law with the greatness of Allah in creating everything in balance.	Allah created everything with the right size, as explained in Surah Al-Furqan: 2.

By conducting experiments, students not only test theories empirically but are also invited to reflect on how the laws of nature, which work perfectly, have been arranged by Allah, as explained in the verses of the Qur'an. In addition, experiments aim to foster scientific attitudes, such as curiosity, critical thinking, and systematicity (Suciati et al., 2022), as well as build spiritual values, including gratitude, responsibility, and awareness, to utilize science for the benefit of humanity and environmental sustainability in accordance with Islamic teachings.

### b. Habituation and Real Practice

The essence of science learning is to teach students to engage in investigations, which can help improve their attitudes and skills (Kurniawan et al., 2019). Activities

in Islamic-based science learning also aim to instill scientific understanding that is not only theoretical, but also applied in everyday life as a form of practicing Islamic values. According to [Sudirman et al. \(2022\)](#), the implementation of science learning depends on the degree to which teachers apply the recommended practices. One way to achieve this is to provide support to teachers in designing learning opportunities that integrate top-down learning objectives with bottom-up learning activities ([Mørch et al., 2023](#)). Here, the teacher acts as a facilitator, helping students access and work on the program and coordinating discussions after they have completed the assignment ([Erickson et al., 2019](#)). According to [Indrawati and Nurpatri \(2022\)](#), the delivery of natural science education materials by teachers who tend to lecture, discuss, and ask questions causes learning to be more centered on the teacher as the primary source of information, which hampers students' creativity in developing their scientific abilities. Therefore, through habituation, students are invited to observe, respond, and internalize the science concepts they learn with a more contextual approach, such as maintaining environmental cleanliness as a form of concern for God's creation, recycling to reduce waste as part of ecological responsibility, and getting used to energy and water saving behavior in accordance with Islamic teachings about not being excessive in using resources.

According to [Prince et al. \(2024\)](#), students achieve mastery of each task and develop a deeper understanding of related concepts, enabling them to apply this knowledge to problem-solving. Children who need the most attention and supervision may benefit the most ([Samuels & Onuoha-Jackson, 2023](#)). In practices such as planting and caring for plants at school, observing the life cycles of living organisms, and conducting simple experiments at home, they can receive the most benefit. Students learn that science is not merely a classroom subject but an essential aspect of everyday life that must be applied thoughtfully and responsibly. Project designs like this provide flexibility to work around holidays or exams, because students can work on improvements or development of resources at any stage of the project ([Patel et al., 2017](#)).

In this way, science learning not only builds intellectual intelligence but also forms the character and spiritual awareness of students, enabling them to apply the knowledge they have acquired responsibly as a form of worship to Allah.

**Table 3. Habits and Practices**

Activity	Natural Science value	Islamic values
Planting and Caring for Plants (Green School Program)	Observing plant growth and understanding the process of photosynthesis	Preserving nature is part of Allah's mandate (QS. Al-A'raf: 31)
Water and Energy Saving Program	Accustoming students to use water and electricity wisely	Avoiding waste as commanded in (QS. Al-Isra': 26-27)
Recycling and Waste Management	sorting organic and inorganic waste and making crafts from used materials as a form of creativity	Cleanliness is part of faith (HR. Muslim)
Observation of Natural Phenomena (Sun, Rain, and Moon)	observing the sunrise and sunset, rain, and moon phases to understand the natural cycle	(QS. Al-An'am: 96) about Allah who created the alternation of day and night.
Science Experiments	observing the process of water capillarity, changes in the state of matter, or the force of gravity	(QS. Ar-Rahman: 7-8) about balance and order in Allah's creation.

Through this practical experience, students not only gain an academic understanding of science but also develop a spiritual awareness that science is a means to get to know and draw closer to God. At the same time, instill a character that cares about the environment, is thrifty, and is responsible.

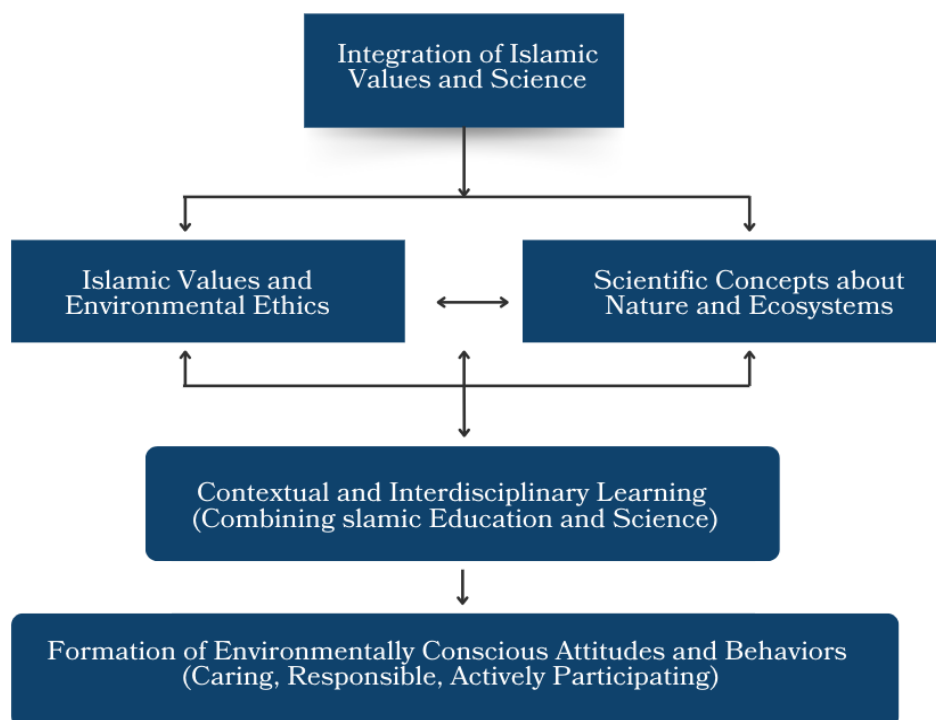
### **3. Raising Environmental Awareness of Elementary School Students**

The primary school age represents a crucial stage in children's character development, during which educators can effectively instill fundamental values such as a love for nature, social responsibility, and environmental ethics through engaging and context-based learning approaches. Educators can design integrated learning using themes or topics that explore a discourse from multiple perspectives or scientific disciplines, enabling learners to understand and relate to the material more easily (Murfiah, 2017). Through the integration of environmental education in various subjects, such as Natural Sciences, Islamic Education, and Civic Education, teachers can insert the values of nature conservation, waste management, the importance of greening, and environmentally friendly lifestyles. In addition, extracurricular activities such as school gardens, waste banks, or Adiwiyata school programs can also serve as valuable learning tools that encourage students to be actively involved in protecting their environment from an early age (Istiana et al., 2020).

Increasing environmental awareness in elementary school students requires consistent daily practices in both the school and home environments (Carpendale et al., 2025). Environmental awareness is a mental and spiritual attitude that grows from a deep understanding of the importance of maintaining, preserving, and maintaining nature as an integral part of human life, which encourages individuals to act responsibly towards the surrounding environment by not damaging, polluting, or over-exploiting natural resources, but establishing a harmonious and sustainable relationship between humans and nature for the survival of current and future generations.

Teachers have a strategic and fundamental role in teaching environmental awareness to students (Hidayah & Sugiarto, 2015). Through a creative, integrative, and inspiring pedagogical approach, teachers not only convey knowledge about the importance of protecting nature but also instill values of care, responsibility, and love for the environment through contextual learning, project-based activities, and real examples in daily behavior at school, so that students not only understand the concept of the environment theoretically. They are also encouraged to internalize and consistently apply these values in their daily lives, cultivating a generation that is environmentally aware, caring, and committed to the preservation of the Earth.

Students' habits in protecting the environment include bringing their own drinking bottles, not littering, utilizing used goods for handicrafts, and understanding the importance of maintaining biodiversity around them. If formed early on, these small habits will develop into a collective awareness and sustainable social responsibility, ultimately creating a green, clean, healthy, and environmentally cultured school ecosystem, while giving birth to a generation that can address the challenges of the global ecological crisis in the future.



**Figure 2. Integration Islam and Sains to Raising Environmental Awareness**

## Conclusion

This systematic literature review demonstrates that the integration of Islamic values into natural science education represents a meaningful pedagogical approach for fostering environmental awareness among elementary school students. Embedding Islamic ethical principles such as *khalifah fil ardh* (human stewardship), *amanah* (responsibility), balance (*mīzān*), and cleanliness (*thaharah*) within science instruction strengthens students' awareness at cognitive, affective, and spiritual levels. Environmental phenomena are therefore not understood solely as empirical objects, but as moral responsibilities that frame human–nature relationships within a holistic educational perspective.

The findings further indicate that integrated thematic learning, contextual instruction grounded in Qur'anic reflection, and experiential learning activities are the most effective strategies for operationalising the integration of Islam and science in primary education. However, the existing body of literature remains largely qualitative and descriptive, with limited empirical evidence demonstrating sustained behavioural change related to environmental practices. This limitation highlights the need for future studies to employ longitudinal and mixed-method research designs, develop standardised indicators of environmental awareness, and examine diverse educational contexts. Overall, this review positions Islamic values not merely as complementary moral content but as an epistemological foundation that enriches science education and supports the formation of environmentally responsible character from an early age.

## References

- [1] Ali Wafa. (2023). Integration of Religious Knowledge with Science and

- Technology in Islamic Education. *Maklumat: Journal of Da'wah and Islamic Studies*, 1(1), 11–20. <https://doi.org/10.61166/maklumat.v1i1.2>
- [2] Aprison, W., & Junaidi, J. (2022). The Integration Of Religious Values Into Sciences-Related Topic Toward Postmodernism Of Science In Islam. *AL-ISHLAH: Jurnal Pendidikan*, 14(4), 5885–5896. <https://doi.org/10.35445/alishlah.v14i4.2058>
- [3] Basri, H., & Abdullah, A. (2024). Curriculum Integration Constructs in Integrated Islamic Elementary School. *Tafkir: Interdisciplinary Journal of Islamic Education*, 5(1), 79–99. <https://doi.org/10.31538/tijie.v5i1.873>
- [4] Bujuri, D. A. (2024). Science-islam integration in islamic elementary school: a development of islam-based thematic teaching material. *Jurnal Ilmiah Pendidikan Dasar*, 11(1), 32. <https://doi.org/10.30659/pendas.11.1.32-49>
- [5] Carpendale, E. J., Green, M. J., Dix, K. L., Tzoumakis, S., Williams, K. E., White, S. L. J., Carr, V. J., & Laurens, K. R. (2025). An exploratory evaluation of universal social-emotional learning programs delivered during elementary school to Australian students. *Journal of School Psychology*, 110(August 2023), 101447. <https://doi.org/10.1016/j.jsp.2025.101447>
- [6] Erickson, M. G., Erasmus, M. A., Karcher, D. M., Knobloch, N. A., & Karcher, E. L. (2019). Poultry in the classroom: effectiveness of an online poultry-science-based education program for high school STEM instruction. *Poultry Science*, 98(12), 6593–6601. <https://doi.org/10.3382/ps/pez491>
- [7] Firdaus, F. A. (2024). Membangun Kesadaran Lingkungan Melalui Kurikulum Pendidikan Islam Kontribusi terhadap SDGs. *Jurnal TarbiyahMu*, 4, 13–21. <https://ejournal.stitmuhba.ac.id/index.php/TarbiyahMU/article/view/63>
- [8] Haqiqi, A. K. (2018). Analisis Faktor Penyebab Kesulitan Belajar Ipa Siswa Smp Kota Semarang. *Edu Sains: Jurnal Pendidikan Sains & Matematika*, 6(1), 37. <https://doi.org/10.23971/eds.v6i1.838>
- [9] Hidayah, I., & Sugiarto. (2015). Model of Independent Working Group of Teacher and its Effectiveness towards the Elementary School Teacher's Ability in Conducting Mathematics Learning. *Procedia - Social and Behavioral Sciences*, 214(June), 43–50. <https://doi.org/10.1016/j.sbspro.2015.11.591>
- [10] Indrawati, E. S., & Nurpatri, Y. (2022). Problematika Pembelajaran IPA Terpadu (Kendala Guru Dalam Pengajaran IPA Terpadu). *Educativo: Jurnal Pendidikan*, 1(1), 226–234. <https://doi.org/10.56248/educativo.v1i1.31>
- [11] Istiana, R., Suhardi, E., El Savada Misdaligo, N., Zajuli Ichsan, I., Vivanti Sigit, D., Fadli Hazhar Fachrial, N., Ageng Prayitno, T., Pramita Arif, W., & Imas Rismayati, A. (2020). Perilaku Bertanggung Jawab Lingkungan: Kesadaran Lingkungan Siswa pada Pendidikan Biologi. *Jurnal Pedagogi Hayati*, 4(2), 87–96. <https://ojs.umrah.ac.id/index.php/pedagogihayati/article/view/2786>
- [12] Kahmann, R., Droop, M., & Lazonder, A. W. (2024). Dutch elementary school teachers' differentiation practices during Science and Technology lessons. *Teaching and Teacher Education*, 145(May), 104626. <https://doi.org/10.1016/j.tate.2024.104626>
- [13] Kasmawati, K., Herlian, H., Adam, A., Deluma, R., Abubakar, A., & Muliyani, M. (2023). Transformation of Islamic Education: Fostering Exemplary Character through Integrated Curriculum in Islamic Elementary Schools. *Journal of Leadership, Management and Policy in Education*, 1(2), 33–40. <https://doi.org/10.51454/jlmpedu.v1i2.427>
- [14] Kumar, P., Sahani, J., Rawat, N., Debele, S., Tiwari, A., Mendes Emygdio, A. P., Abhijith, K. V., Kukadia, V., Holmes, K., & Pfautsch, S. (2023). Using empirical science education in schools to improve climate change literacy. *Renewable and Sustainable Energy Reviews*, 178(November 2022), 113232. <https://doi.org/10.1016/j.rser.2023.113232>
- [15] Kurniawan, D. A., Astalini, A., Darmaji, D., & Melsayanti, R. (2019). Students'



- attitude towards natural sciences. *International Journal of Evaluation and Research in Education*, 8(3), 455–460. <https://doi.org/10.11591/ijere.v8i3.16395>
- [16] Ludiya, L. F. (2024). Pentingnya Membangun Kesadaran Lingkungan Melalui Pembelajaran PKN di Sekolah Dasar Guna Membentuk Karakter Peduli Lingkungan pada Siswa. *Jurnal Pendidikan Guru Sekolah Dasar*, 1(3), 11. <https://doi.org/10.47134/pgsd.v1i3.529>
- [17] Machsun, T., Istikomah, I., Romadlon, D. A., & Rojii, M. (2020). Interkoneksi Sains Dan Agama Dalam Pengembangan Pendidikan Islam Di SMA Muhammadiyah 2 Sidoarjo. *IMTIYAZ: Jurnal Ilmu Keislaman*, 4(2), 146–162. <https://doi.org/10.46773/imtiyaz.v4i2.95>
- [18] Mansir, F. (2022). Integration of Islamic Science and Science in Schools: Studies on Learning Islamic Religious Education in the Digital Era. *TADRIS: Jurnal Pendidikan Islam*, 17(2), 413–425. <https://doi.org/10.19105/tjpi.v17i2.6769>
- [19] Mørch, A. I., Flø, E. E., Litherland, K. T., & Andersen, R. (2023). Makerspace activities in a school setting: Top-down and bottom-up approaches for teachers to leverage pupils' making in science education. *Learning, Culture and Social Interaction*, 39(November 2021). <https://doi.org/10.1016/j.lcsi.2023.100697>
- [20] Murfiah, U. (2017). Implementasi Model Pembelajaran Terpadu Dalam Mengembangkan Kreativitas Anak Sekolah Dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 1(1), 94. <https://doi.org/10.23969/jp.v1i1.230>
- [21] Nurdyansyah, N., & Arifin, M. B. U. B. (2018). *Integration of Islamic Values in Elementary School*. 125(Icigr 2017), 190–192. <https://doi.org/10.2991/icigr-17.2018.46>
- [22] Nuzula, N. F., & Sudibyo, E. (2022). Penerapan Model Problem Based Learning untuk Meningkatkan Kemampuan Literasi Sains Siswa SMP pada Pembelajaran IPA. *Jurnal: Pendidikan Sains*, 10(3), 360–366. <https://ejournal.unesa.ac.id/index.php/pensa/article/view/45386>
- [23] Patel, S., DeMaine, S., Heafield, J., Bianchi, L., & Prokop, A. (2017). The drosos4schools project: Long-term scientist-teacher collaborations to promote science communication and education in schools. *Seminars in Cell and Developmental Biology*, 70, 73–84. <https://doi.org/10.1016/j.semcdb.2017.07.025>
- [24] Prasetyo, R., & Ahmad, P. (2020). Integrasi Interkoneksi Esensi Pendidikan Islam dalam Pembelajaran Sains. *Prosiding Konferensi Integrasi Interkoneksi Islam Dan Sains*, 2(1), 331–341. <https://sunankalijaga.org/prosiding/index.php/kiiis/article/view/420>
- [25] Prince, G., Rees Lewis, D., Pollack, T., Karam, S., Touma, E., Khorzad, R., Cooper Bailey, S., Gatchell, D., Ankenman, B., Kravarusic, J., Sabol, T., Holl, J., & Wallia, A. (2024). Employing user-centered design and education sciences to inform training of diabetes survival skills. *Journal of Clinical and Translational Endocrinology*, 37(July), 100364. <https://doi.org/10.1016/j.jcte.2024.100364>
- [26] Ramadhani, A. I., Vebrianto, R., & Anwar, A. (2020). Upaya Implementasi Integrasi Nilai-Nilai Islam dalam Pembelajaran IPA di Sekolah Dasar. *Instructional Development Journal*, 3(3), 188. <https://doi.org/10.24014/idj.v3i3.11727>
- [27] Rokhman, M., & Amami, F. (2021). Integration of Islamic Religious Education and Science Learning in Elementary School. *Ta Dib: Jurnal Pendidikan Islam*, 10(2), 331–339. <https://doi.org/10.29313/tjpi.v10i2.8971>
- [28] Salim, A., & Mukhibat, M. (2020). Interkoneksi Pendidikan Agama Islam Dan Sains Di Sma Islam Al Azhar 09 Yogyakarta. *EDUKASIA: Jurnal Pendidikan Dan*

- Pembelajaran*, 1(2), 161–173. <https://doi.org/10.62775/edukasia.v1i2.15>
- [29] Samuels, W. E., & Onuoha-Jackson, N. (2023). Learning to care: An in-school humane education program improves affective and cognitive empathy among lower-elementary students. *International Journal of Educational Research Open*, 5(May), 100292. <https://doi.org/10.1016/j.ijedro.2023.100292>
- [30] Saripudin, P. (2018). Integrasi Nilai Islam dalam Pembelajaran Pendidikan Sains (IPA) di Sekolah Dasar Negeri Sadamantra Kuningan. *Oasis: Jurnal Ilmiah Kajian Islam*, 2(2), 41–61. <https://doi.org/10.24235/oasis.v2i2.2665>
- [31] Setiawan, B., Innatesari, D. K., Sabtiawan, W. B., & Sudarmin, S. (2017). The development of local wisdom-based natural science module to improve science literation of students. *Jurnal Pendidikan IPA Indonesia*, 6(1), 49–54. <https://doi.org/10.15294/jpii.v6i1.9595>
- [32] Siew-Eng, L., Mahdi, R., Mohamadin, M. I., & Manaf, B. H. A. (2015). Second Chance Science Education for School Leavers. *Procedia - Social and Behavioral Sciences*, 167, 288–292. <https://doi.org/10.1016/j.sbspro.2014.12.676>
- [33] Suciati, R., Susilo, H., Gofur, A., Lestari, U., & Rohman, I. (2022). Millennial students' perception on the integration of Islam and science in Islamic universities. *Indonesian Journal of Islam and Muslim Societies*, 12(1), 31–57. <https://doi.org/10.18326/ijims.v12i1.31-57>
- [34] Sudirman, S., Sarjan, M., Rokhmat, J., Hamidi, H., Muliadi, A., Azizi, A., Fauzi, I., Yamin, M., Muttaqin, M. Z. H., Rasyidi, M., Ardiansyah, B., Khery, Y., & Rahmatiah, R. (2022). Praktik Penilaian Guru Pendidikan Sains antara Keyakinan atau Pengetahuan Guru? Perspektif Filsafat. *Jurnal Ilmiah Profesi Pendidikan*, 7(3c), 2018–2025. <https://doi.org/10.29303/jipp.v7i3c.889>
- [35] Sukma, E., Ramadhan, S., & Indriyani, V. (2020). Integration of environmental education in elementary schools. *Journal of Physics: Conference Series*, 1481(1). <https://doi.org/10.1088/1742-6596/1481/1/012136>
- [36] Sutiana, D., & Nugraha, M. S. (2025). Integration of Islamic Values and Science in Islamic Primary Schools: A Philosophy of Science Approach. *Journal of Elementary Education Research and Practice*, 1(1), 21–34. <https://doi.org/10.70376/bv7bqx53>
- [37] Ulu, E., & Kiraz, A. (2014). Science Education and Cognitive Development in Updated 2012 Pre-school Curriculum. *Procedia - Social and Behavioral Sciences*, 136, 438–451. <https://doi.org/10.1016/j.sbspro.2014.05.354>
- [38] Zain, Z., & Vebrianto, R. (2017). Integrasi Keilmuan Sains Dan Islam Dalam Proses Pembelajaran Rumpun Ipa. *Seminar Nasional Teknologi Informasi Komunikasi Dan Industri*, 0(0), 703–708. <https://ejournal.uin-suska.ac.id/index.php/SNTIKI/article/view/3198>