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How To Integrate Environmental Education: Analysis of Teachers' Perspectives in Integrated Islamic Science Schools

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Abstract

The serious environmental issues require a variety of teaching and learning approaches towards environmental solutions. Environmental education is crucial in solving the environmental issues and enhance ethical behaviour towards the environment. However, since environmental education is conducted across the curriculum, the application of environmental education depends on the creativity of the teacher. Therefore, this study aims to explore the implementation approaches of environmental education in Integrated Islamic Science Schools based on the teachers' perspectives. This qualitative study was conducted using interview from 9 teachers from two Integrated Islamic Science School; four science teachers, four Islamic education teachers and an advisory teacher of Geography and Environmental Club. Data from teacher's interview transcriptions has been analyzed according to the theme of environmental education approach that were implemented by teachers. The findings show that the implementations of environmental education in the Integrated Islamic Science Schools have been implemented through formal and informal education. The integration of environmental education was also supported by the administrators through learning activities in the classroom and co-curriculum. This efforts hopefully will foster student's awareness in changing the environmental behavior.

Keywords: environmental education, environmental behavior, environmental values, integrated Islamic Values

1. Introduction

Climate change and the worsening environmental damages call for the need to strengthen environmental education in the community (Tolppanen et al., 2022; Özmen & Karamustafaoğlu, 2006; Rahman, 2017). Kamidin & Roslan (2014) stressed that more attention should be given to improving pro-environmental behaviour through environmental education, along with improving technology in environmental management, infrastructure development, and establishing laws and policies to overcome environmental problems. However, implementing environmental education depends on the commitment of stakeholders, including teachers, parents, government, environmental NGOs, and local communities (Deng et al., 2022; Wang et al., 2022).

Environmental education in Malaysia is carried out through formal, non-formal and informal (Ahmad, 2009; Mustam & Daniel, 2016). Environmental education is formally conducted across the school curriculum (Ministry of Education, 1998). Meanwhile, semi-formal education comprises environmental education learning activities outside the classroom. These activities are systematically organised by the Environment Club and other parties, such as awareness programmes run by animal conservation centres. Lastly, informal education involves indirect learning through mass media, families, local communities, and NGOs related to the environment. Environmental education, formal or otherwise, is one of the efforts made to educate the community to live a prosperous and sustainable life (Rahman, 2017; Ahmad, 2009).

According to Palmer & Nael (1994), environmental education should include three elements: education *about* the environment, education *in* the environment, and education *for* the environment. The Environmental Education Learning Approach Model for environmental education involves the cognitive aspect of the individual's understanding and knowledge of the environment, while education *about* the environment highlights aspects of appreciation and emotion that help individuals become more sensitive to the environment. On the other hand, education *for* the environment emphasises behavioural changes in individuals for environmental conservation (Kurokawa et al., 2023). The association between the three approaches, namely education *about*, *in* and *for* the environment, leads to curriculum planning translated through a run and environmental learning activities at the school level (Ahmad, 2009).

Several environmental education programmes have been conducted in schools to achieve the goals of environmental education at the school level. Among them are *the Eco-schools Programme* (Shunmugan, 2018), which has been introduced in Malaysia and other countries. It focuses on cultivating a green lifestyle among the school community and providing the school environment with green technology. The findings of past studies showed that while students have high and moderate knowledge and awareness, their environmental behaviour and practices are still low (Mageswary et al., 2006; Mahat et al., 2017). Therefore, there is still some barrier to implementing Environmental Education to evoke behaviour change.

Rahman (2017) argued that the lack of emphasis on the value of environmental education is a barrier to achieving the goal of environmental education to change behaviour toward

environment conservation, especially among students (Rahman, 2017). In this regard, teachers' approaches to implementing Environmental education have been less studied than other aspects like students' environmental awareness. Therefore, this study will focus on teachers' approaches to implementing environmental education that is expected to help foster students' awareness of ethical behaviour towards environmental preservation.

2. Literature Review

The literature review indicated teachers' use of various approaches in implementing environmental education in schools. Teachers infuse environmental education formally by giving explanations, discussions, demonstrations, question-and-answer sessions, experiments, and simulations, as well as hands-on activities like role-play and project-based learning (Derevenskaia, 2014; Mustam & Daniel, 2016). In addition, informal teaching is implemented through environmental campaigns, field trips, out-of-class activities, recycling activities, and competitions (Mustam & Daniel, 2016). Continuous support from the school community is required to shape the eco-literacy culture and create an environmental awareness (Adela et al., 2018).

Teachers face numerous constraints which hinder the implementation of environmental education. Among them include the lack of materials, funding, support from school administrators, limited knowledge about environmental issues, environmental education, no preparation time, and large class size (Rahman et al., 2018). Stanisic and Maksic (2014) found that the majority of Serbian primary school students were not familiar with the facts related to the topics of the preservation of human health and the environment in the school science curriculum. The challenges teachers encounter in implementing environmental education in Serbia help devise suggestions for changes to the curriculum, pedagogy, and teacher training to improve environmental education. In addition, the teachers need training related to environmental education.

Ramsaroop and Rooyen (2013) showed that teachers lack an understanding of the biophysical dimension. This problem caused the teaching of environmental education incorporating all other dimensions would be difficult to achieve. It showed that all teachers must develop pedagogical content knowledge specific to environmental education. A thorough understanding of all the environmental education dimensions by teachers will ensure that they can address environmental issues comprehensively.

3. Research Methodology

3.1 Research Context

This study explores the approaches to implementing environmental education in Islamic integration secondary schools. The study is a case study that used semi-structured interview methods to obtain data from science and Islamic education teachers and the Geography and Environment club advisors. Two schools involved in this study were Ulul Albab Mara

Science College and Islamic Integrated School, Selangor, Malaysia.

3.2 Research Participants

Sampling was used in this study to ensure that the study's participants could provide accurate and meaningful information. Nine teachers were involved in the study. The selected teachers comprise science teachers, Islamic education teachers, and advisors of the Geography and Environment Club (Four teachers from Ulul Albab Mara Science College and five science teachers from Islamic Integrated Schools, Selangor). The school recommended the teachers based on their experience and expertise in environmental education.

3.3 Data Collection Procedures

The researchers conducted preliminary discussions with the study participants to explain the study's purpose and obtain permission to conduct interviews. The researchers then confirm the date and time of the interview for the study participants according to the time given by the school administrator. The researchers also informed the study participants that each interview session would be recorded for data analysis purposes. All participants voluntarily signed the letter of consent and acknowledgment of participation.

At the beginning of the interview, the researchers used open-ended questions about the school's background guided by interview protocols. The interview was conducted informally as conversations to create a comfortable environment for the participants before proceeding to the more detailed part of the interview on environmental education. The interview protocol is divided into several sections, namely questions related to school background to produce students who are guided by the vision and mission of the school, keyword questions to get the teacher's explanation on the application of environmental education in schools integrated with Islamic science in general and questions in the form of environmental teaching and learning activities in schools. All conversations between the researcher and the participants were recorded using an audio recorder to avoid information dropouts and for transcription purposes.

3.4 Data Analysis Procedures

The data were collected from interviews with the teachers. The researcher analysed the data by manually preparing a verbatim transcription of each interview session. The researcher analysed each transcript through open coding by dividing the same code into several categories. This process continued until all themes and sub-themes related to the approach of implementing environmental education in Islamic Science Integrated were identified and categorised to find the appropriate theme.

The data from each participant were labelled as AS1 & AS2 (Science teacher from school A), BS1 & BS2 (Science teacher from school B), API1 & A PI2 (Islamic education teacher from school A), BP1 & B P2 (Islamic education teacher from school B) and PAS (Geography and Environment coordinator teacher from school B) to distinguish teachers interviewed to facilitate the discussion. Data collected on environmental education approaches in science Islamic integrated schools were divided into several categories: formal learning, informal

learning, and administration school in implementing environmental education in schools.

4. Research Findings

4.1 Implementation of Formal Environmental Education in Schools

Teachers carry out various activities to teach environmental education formally through topics in the syllabus. Among them are: a) project-based environmental management and innovation activities, b) peer-based learning (such as modelling or making new inventions from recycled materials), c) exemplary learning, d) tree and soil therapy, e) dissemination of information through flyers and brochures, video screenings, online applications, f) gallery walk, g) exposing to NGOs related to environmental conservation such as grab cycle h) problem-solving methods i) encouraging them to observe nature and j) use existing modules related to the environment.

4.1.1 Environmental Education Through Project-Based and Innovations

It was found that environmental management in Islamic science-integrated secondary schools involves project-based activities for environmental management and innovation using recyclable materials. It was found that teachers play an important role in guiding students in project-based learning and innovation approaches as mentioned by informants below.

"Projects are indeed mandatory for the lower secondary... The topic of Green House. We want to build a model house ... Use Renewable Air, the Energy Saver, which can recycle EnergY... (AS1).

"We use waste or used material for innovation. Some make soap, some use oil. The science subject teacher often conducts innovation activities"... (PAS).

"*Students innovate using recyclable materials "* (AP1).

4.1.2 Sharing Session with Peers

Students are often involved in peer-sharing sessions during group discussion activities. Students' understanding will be improved by sharing opinions based on their existing knowledge from other reading resources as mentioned by informant below.

"Certain topics like space, it is more about students looking for their own info... We told students to find info and share with friends." (AS1).

4.1.3 Learning from Role Models

Another approach to environmental education is making teachers "role models" to students. This approach to environmental education has implications for teachers in playing an important role in educational institutions.

"Got to start with the actual teachers. Model what needs to be done. And then insyaAllah the children will follow... lead by example" (AS2)

4.1.4 Tree and Soil Therapy

Teachers use the environmental elements around the school as a therapy to create a positive impression for students. Among the environmental therapy, activities identified contacts with trees and walking on the grass on the ground. This therapy can indirectly inculcate a feeling of love for the environment while enjoying the tranquility and beauty of nature.

"There's a teacher who has taught me about therapy- soil therapy, tree therapy... If it's like therapy with nature, if you want... you hug a tree. Haha. hug the tree. Say positive things so that the negative thing comes out. Maybe take off your shoes, take off your socks, walk on the grass ground" (BS2)

4.1.5 Deciminating Environmental Information

Environmental education can be applied in teaching and learning by disseminating information about the environment. The dissemination of environmental information to the students can be seen through learning through simulations, video presentations, and online applications. Teachers can also share information on environmental issues through Flyers and Brochures as a source of reading materials on the environment. This is shown in the excerpt of a teacher's interview as follows:

"Announcement using Flyers, Brochures... We have a notice board that Flyers, brochures about the information we're going to share to be reading material." (PAS)

"I also like to use videos, simulations from those videos and ask students to elaborate. The video is a stimulus for them to think" (AS1)

"I always see that students share videos, sharing the verses of al-Quran and what has happened near our earth, with Allah telling and saying and it is our responsibility to conserve the environment." (PAS)

"We use online apps; right now we have Kahoot for quizzes. Lots of use technology because you want to attract students with technology." (PAS)

4.1.6 Gallery Walk

Teachers also practice 21st-century learning strategies in teaching and learning in schools. An example of the activities carried out by science teachers at Ulul Alab Mara Science College is Gallery Walk. Student-centered activities like group discussions enable students to collaborate in small groups and communicate on relevant topics during PdP activities. Students can also actively move from one station to another.

"Gallery Walk... students prepare each station, and others are going to move from one station to another place." (AS1)

4.1.7 Introducing Students to Environmental Non-Government Organisation

Teachers expose students to NGO environmental activities, such as the *grab cycle*, and actively participate in food wastage prevention campaigns. This is seen as an initiative to introduce activities to cultivate awareness among the students.

"Normally, I would introduce them to the outside organisations that are talking about the environment. For example, I am introducing a grab cycle, which is trying to reduce food (wasteful food), like the one near the restaurant, which is more than they would normally throw away. So grab this cycle sells for a lower price" (AS2).

4.1.8 Problem-Solving Approach

Students also embark on solving environmental-related problems highlighted in their science textbooks. Depending on the topic, the teacher guides students to identify the main cause of the issue, its impacts on the environment, and methods to overcome it.

"The science textbooks have included the IAP set of the topic. For example, there is a topic on biodiversity in the form 2 science textbook, so we teach them to identify factors affecting the environment, right? What do humans do that can affect the environment? How can they prevent it? " (AS1).

4.1.9 Encouragement to observe the Environment

The teacher also encourages students to observe the environment. Through the excerpt of the interview below, the teacher encourages students to observe what is around them so that students can appreciate everything they create and learn something from environmental life.

"We encourage the students in their journey to observe nature and oil palms, encouraging them to observe the surroundings along the way. . We will ask back when they get back, what do you see along the way?... they take the initiative to tell a story" (AS1)

4.1.10 Learning from Module

According to the teacher teaching in SMAP Kajang, various modules are available as teachers' reference for facilitating learning. For environmental education, teachers use the modules provided by the school to teach the environmental elements to the students.

"To say we have to have a special module, we have got too many modules that we to refer.. Then what's in the head. What we always practice.. that's what we always apply to students" (BS1)

"So far, we use the module provided by MOE . We teach Concept 3R, 4R, ReThink." (PAS)

4.2 Implementation of Non-Formal Environmental Education in Schools

Informal environmental education also takes place in schools through environmental-related clubs, environmental awareness campaigns, and involvement in programmes organised by external parties or NGOs.

4.2.1 Environmental Club

Based on the study's findings, both schools have clubs related to the environment. The club's activities discuss sustainable development goals, community services, and campaigns. In addition, students who follow the environmental club also took the initiative by pasting environmental issues for other students' knowledge.

"There's also a club. Like teacher Ainul, she is the advisor of the environmental club. My club is the world culture club. In World culture, we talked about sustainable development goals from the united nation… Specifically, in our club, people usually do CRS (community service responsibility), a campaign... How to recycle paper. "(AS2)

"If it's informal, there's a geography and environmental club. The student will create his creativity near the corner, and he will show off the relevant environmental issues." (BS1)

"There is a geography and environmental club. The environmental education through the club." (BS2)

"geography and environment as well as school cooperatives." (PAS)

4.2.2 Environmental Campaign

Campaigns conducted in schools, either organised by the school or NGOs, assist students' involvement in environmental conservation efforts. Among the campaigns launched are green, love the environment, go green, TREES (Treat Every Environment Special), recycling, and planting trees.

"We are going to launch a green program, love the environment, Go green.. launch of TREES. We encourage them. We have a collection point to deliver goods for recycling

"Parents like to donate trees, gardens... There are also institutions like last year. We had a collaboration with UM. They have a slot about tree growers on a... The one in the bottle... we received letters about many environmental campaigns and received a positive response for the students" (AS1)

"We recycle a lot of materials too... ... We'll send them to the recycling centre"(BS1)

"We have one more box for clothes, the pink box. We put it there at the end of last year. There are boxes for clothes, shirts, second-hand bags, and shoes for teachers or students... If there are good quality clothes, we'll put them in the cooperative." (BS2)

"He plants herbs dan he sells them. Means that he has an initiative there " (BS1)

"There are trees planted nearby " (BS2)

4.2.3 Activities carried out by external parties or NGOs

Informal environmental education is also supported by programmes organised by external parties or NGOs such as TREES (*Treat Every Environment Special),* iNaturalist, green schools, and go green. Based on the study's findings, school B is more actively involved in environmental education activities organised by external parties. Among the activities are environmental-themed competitions, identifying plants or animals in the local area, innovation from recycled materials, or innovation to prevent mosquito larvae using pegaga leaves.

"We also joined TREES (Treat Every Environment Special), one of the NGOs that offers students to participate in environmental-themed competitions" (PAS1)

"The school has a lot of outdoor activities. Like a tree iNaturalist where they identify the species in the local area. So students and teacher can take pictures to identify insects like ants and other trees" (BS2)

"In 2016, the teacher brought pupils to the Green School Award organised by the Municipal Council... So still maintain that sustainability, the consumerism of recycled goods, we innovate…" (PAS)

"There are many green innovations... So the students will do recycling materials, make paper, etc. They also make environmental-related innovations like pegaga leaves to kill mosquito larvae without abatic pills,... It is good for the environment too…." (BS1).

4.2.4 Administrative Support in Supporting Environmental Education in Schools

The study found that both schools received support from the administrators, specifically the school principal, in educating the community on environmental conservation. Through interview excerpts, the principal of school A has adopted the concept of a *paperless* school, while the principal of school B provides bins to separate waste from recyclable materials. The school introduced 'no trash Sunday' to reduce outside garbage, especially from food brought by parents visiting the students.

"Our principal emphasises being paperless. We use QR codes a lot. The principal is also very supportive towards environmental conservation, reuse, reduce, recycle" (AS1)

"Last year, the principal introduced different garbage bins. He put them near the back of the teacher's room, different bins for plastic, paper, and other waste." (BS1)

"The principal told us there are no bins on Sundays to prevent rubbish from piling up when parents bring food when they meet students"(PAS).

5. Discussion

The implementation of environmental education in both Islamic science-integrated schools is done formally and informally. Environmental education is implemented formally in and out of classroom activities. In contrast, informal learning is carried out outside the classroom using three methods: environmental-related clubs, environmental awareness campaigns, and involvement in programmes organised by external parties or NGOs.

Teachers in both schools play their respective roles in applying environmental education using various means through their teaching methods. They disseminate knowledge and become a role model to the students to help produce a generation with environmental awareness and can manage the environment well. A teacher is the most important person in educating young people to be leaders in protecting the environment. The findings showed that teachers use the environmental elements in the surrounding school area as a medium to help students appreciate nature and bring a positive aura to the students. This can also be an initiative to create love for the environment. This coincides with the concept of ecopsychology (Kamidin & Roslan, 2014).

In steering towards the development of the 21st century, a teacher needs to master two types of knowledge, namely knowledge of the field taught and pedagogical skills in using technological elements. Based on a study by Aminrad (2013), mass media and technology greatly impact students in environmental education. The dissemination of environmental information to the students can be seen through simulation, video screening, and online applications by teachers in both schools. Learning through this technology is the main method used by teachers to facilitate learning in environmental education. Recognising the importance of teachers in transforming, the Ministry of Education Malaysia has taken the initiative to introduce 21st-century learning that emphasises the use of electronic devices, such as computers, the internet, tablets, etc., in teaching and facilitation through the latest curriculum.

Effective teachers use various learning strategies to make their teaching more interesting. Teachers apply problem-based learning as an alternative to plan lessons that actively engage students. In this process, students need to use critical and creative thinking skills to find solutions to problems related to environmental issues. Critical and innovative thinking is also applied through *project-based learning* activities that require students' ability to innovate from natural resources or use waste or recycling. Through this study, science and environmental teachers actively implemented project-based learning and innovation with their students. This is in line with the Malaysia Education Development Plan 2013-2025 (PPPM 2013-2025), where the government encourages activities based on creativity, innovation, and invention to train students to have a first-class mindset and equip and form the human capital of the millennium 21 (Ministry of Education, 2017).

In addition, the teacher applied observation of the environment to entice the students to learn about the environment. Based on a study by Kadri (2015), a fundamental element of critical thinking based on the Holy book, the Quran, is synthesising listening, viewing, and contemplation activities. It involves the senses of hearing, vision, and contemplation in critical focused, and deep thinking. The statement from the teacher at school A about encouraging the students to observe what is around them is an effort that can help students to learn something and take lessons for each incident to appreciate the process of natural life. Thus, the method of observing nature can be used as a source of inspiration in giving people ideas for prosperous survival. In addition, the analysis found that sharing knowledge between teachers and students related to the environment in both schools touched on Islamic values related to environmental conservation. Mangunjaya (2010) and Yaacob et al. (2017) further asserted that Islamic values related to environmental protection are important in producing ethical human beings towards the environment. However, this study only focuses on the context of activities of environmental education implementation.

Environmental education is implemented informally in both schools through environmental-related clubs, campaigns, and activities organised by outside agencies. These activities are focused on increasing students' involvement in environmental conservation efforts. The study concluded that both schools had made efforts to engage the school community in raising awareness of environmental preservation. In this regard, environmental-related education also receives support from the administrators through

classroom and co-curricular learning activities. Both schools have received good support from the principal in educating the community on environmental conservation. Overall, implementing environmental education among students in Islamic science-integrated schools is seen as education *about*, *in,* and *for* the environment, where teachers have focused on building students' knowledge of the environment, fostering awareness of environmental care and providing opportunities for students to engage in environmental conservation activities through classroom learning and outdoor activities. However, environmental education activities in the integrated Islamic Science School should integrate environmental concepts and Islamic values related to environmental preservation to align with the school's goal of prioritizing ijtihadic, Quranic and Encyclopedic thinking (Rahman et al., 2020).

6. Conclusion

Environmental education can increase students' self-awareness to evoke a positive attitude and behaviour shift to facilitate sustainable development. The study examined environmental education's application in two Islamic-science integrated schools in Selangor. The application of environmental education implemented in schools is formally and informally based on the teacher's perspective. It also received support from the administration in implementing environmental education in schools. Overall, teachers use various methods in applying environmental education while conducting the teaching and learning process with students. Learning through simulation, video screening, and online applications is the most domain-applied method by teachers in applying environmental education to students. Based on the Environmental Education Learning Approach Model, teachers apply education *about* and *in* the environment that only focuses on building knowledge and awareness in students related to the environment through classroom learning and outdoor activities. While education *for* the environment is applied through recycling and innovation activities, it needs to be expanded to change students' past behaviour towards environmental preservation.

This study is based only on the teacher's perspective and cannot be seen through the actual situation in the real environment. Therefore, it is proposed that the method of observation and interview with students or school administrators be carried out to further strengthen the study's findings. In addition, the study suggested that training and courses on readiness for environmental education be given to all teachers, especially Islamic education teachers, and not focused on science teachers who teach in schools. Teachers should be prepared with skills and knowledge to include creative and interesting art elements in PdPc (Teaching, learning, and facilitation). In this regard, teachers need to understand the core of environmental education to help the students appreciate the context of the lessons. Therefore, teachers need to be wise in diversifying methods to apply environmental education for the next generation of living languages. Hopefully, this effort will help foster students' awareness of ethical behaviour change toward preserving the environment.

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