Eco-pesantren modeling for environmentally friendly behavior: new lessons from Indonesia

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ABSTRACT

Pesantren or Islamic boarding school plays a vital and strategic role in improving environmentally sound education. *Eco-pesantren* is a movement that puts a high concern for the environment. This study aimed to analyze *eco-pesantren* modeling techniques in education. It is a case study with a qualitative research method. The research was conducted at Islamic Boarding School Sumber Mental Agama Allah (SPMAA), Turi Lamongan, East Java, Indonesia. Data were collected by observation, interviews, questionnaires, and document studies. This research concluded that modeling techniques can at least be pursued in four main ways: the individual role model of *pesantren* leaders; infrastructure and their use; governance systems; and culture or traditions. Besides, using integrated modeling techniques at both school and *pesantren* culture can increase insight and application of environmentally friendly behavior through a direct observation and habituation of healthy educational practices. Modeling can help students turn abstract ideas of green life into actual implementations. Direct observation of continuous practices equips students with the knowledge required to perform expected behaviors. Research on modeling assists *eco-pesantren* institutions encourage learning and practices about healthy environment. In the global context, it can be a role model for the implementation of environmentally friendly education that promotes environmentally sound learning.

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1. INTRODUCTION

Eco-pesantren is an Islamic educational institution that voices a considerable concern about the environment and undertake activities related to natural and environmental preservation [1], [2]. Integrating environmental education is crucial to overcoming environmental problems inside and outside *pesantren* (Islamic boarding school) [3]. *Eco-pesantren* aims to create an environmentally friendly *pesantren* [4] by integrating environmental education curriculum with *pesantren* education [5].

One of the concrete implementations of Bandura's theory in education is learning modeling [6], [7]. Modeling technique is a demonstration of certain object or action as an example for student to imitate [8]. It discusses the ideas on how a teacher could exemplify students to learn and to perform expected behavior [9] and it is a part of contextual learning [10]. It covers demonstrating and giving examples of certain activities

or behavior [11]. It can show the way of operating something. It provides models related to materials to develop learning outcomes [12], [13]. Modeling could be effective once students become more informed with the materials studied [14], engage more enthusiastically, provide rich situations, and save cost and time.

Modeling requires good model features, for example, the materials are relevant to the students' demand, compelling, practical, challenging, and rich in activities [15]. Modeling learning mainly adds and searches for observed behaviors, which are then generalized from one observation to another. It involves cognitive processes, so it not only mimics but also adapts to the actions of others with symbolic representations of information and stores it for future use. Modeling is vital as human beings prefer the more competent and stronger models with higher status. Human beings act on a certain awareness of what can be imitated and what cannot. They, with no doubt, anticipate certain outcomes from modeling perceived to be potentially beneficial.

The presence of models in learning helps students think critically. They will observe the models provided to understand better the materials. Not only students received information from the teacher, but they can also dig up information from the models [16]. Consequently, students experience changes in behavior.

Behavior change can be measured in five characteristics [7], namely: showing disinterest, deliberating, designing, doing, and defending. The disinterest stage or the "I do not want to change" stage refers to the condition where a person, community, or organization is unwilling to accept the environmental and biodiversity damage and to refuse that environmental damage can result in disasters [17]. Performing deliberation is the "I may change" stage, where individuals and groups of organizations hesitate to concern on an environmental and biodiversity issue [15], [18]. They do not realize the impact on life if they do not respond to it. As a result, they are not ready to change and may return to be disinterested. To push into the next direction, a decision needs to be made as taking an action is more substantive compared to doing nothing. The third is designing or "I will change" stage, where individuals or communities can accept the issues of environmental sustainability and biodiversity and design a step at political, organizational, and individual level. This action is examined to see how they feel and see it. The next is doing or the "I am changing" stage, which is a plan of action decided by reducing carbon or regulating the house temperature to cope with climate change. The final characteristic is defending or "I have changed" stage, at which societies or organizations begin to integrate their new thinking into daily behavior, typically six months to a year after the first step.

Modeling technique belongs to the contextual approach. It provides a model over knowledge or skill that students can simulate during the learning process. *Eco-pesantren* modeling technique adopts four strategic and integrated modeling techniques. Based on the background of the study, this research analyzes how *eco-pesantren* modeling techniques improve environmentally friendly behavior [19].

2. RESEARCH METHOD

2.1. Research type

This is qualitative research with case study approach. It adopted a single case study as it contains important characters from one or several cases. The case can be a program, event, activity, or individual. The essence of a case study is explaining decisions about why certain case was studied, how to implement it, and what happens in end [20]. The research covers repetitive activities (cycle) with three main stages: i) extensive exploration and usually still moving at the surface level; ii) exploration in a focused and selected manner to achieve a certain level of depth and detail; and iii) checking or confirming the findings. The research stages are divided into three parts, namely preparatory/pre-field, fieldwork, and data analysis. To obtain data according to the research focus, it adopted three techniques: i) interviews; ii) participating observations, focused observations, and selected observations; iii) assessment of selected documents. The three techniques are used to complement each other.

2.2. Participants

The participants in this study were selected using purposive and snowball sampling techniques. It involved *pesantren* founders, *pesantren* leaders, school leaders, and teachers as key informants. In addition, students and parents of pupils are involved as secondary informants. Triangulation on the participants was also performed to obtain accurate data from graduate users, people, and regional educational institutions.

2.3. Instruments

This study was conducted by interview with the selected participants. The interview covered four key points, which were the role model; the infrastructure and their use; the governance system; and the culture or tradition of the educational institution. The key points were then developed during the interview to dig up in-depth information from the informants.

2.4. Data collection

The data were collected through interviews, observations, and documentation. Interviews were conducted with participants to explore information about *eco-pesantren* educational modeling techniques, including role models, infrastructure and their use, governance systems, and cultures of the educational institutions. Meanwhile, observations were made to identify the institutional culture or traditions. The documents collected were manuscripts by the founders of *pesantren*, as well as books and works of *pesantren* leaders used as a foundation in *eco-pesantren* education. In addition, the authors also performed in-depth library studies to collect more data on theoretical concepts.

2.5. Data analysis

The data were analyzed by using Miles and Huberman models [21], which constituted data reduction, data display, conclusion drawing, and data validation. Data were validated by integrating the results of interviews, observations, and document analysis. The interpretation results provided information about *eco-pesantren* educational modeling techniques that could improve environmentally friendly behavior.

3.   RESULTS AND DISCUSSION

3.1. Role model for boarding schools and individuals

A favorable behavior of an induvial can provide useful information. Environmental concerns are demonstrated by the *pesantren* leaders [22], [23], teachers (*ustazds*), and students as shown in Figure 1. The models by *pesantren* leaders (*kyai*) are: living a simple life, saving energy, using goods only when in needs, reuse, reduce, and recycle (3R), reforestation, and cleaning the river. Besides, the leaders also participate in community services; reforestation around Islamic boarding schools [24], making biopore holes, composting waste, recycling: picking up and managing waste around *eco-pesantren* environment, turning off the light when leaving the room, promoting a democratic and fair classroom environment, using appropriate conflict resolution strategies, encouraging diverse and divergent opinions.

Certain examples by the teachers and the other education personnels in *eco-pesantren* serve as models for students [10], [25]. It corresponds to the theory of teacher effectiveness as a model because most students figure out and follow their teachers [26]. The students see teachers as competent figures. There were two factors proven to improve observational learning [27]. The individual examples by students at *eco-pesantren* include participation in community services, composting of waste, recycling, reforestation, cleaning rivers, reusing wearables, picking up garbage, turning off the light when leaving the room, making the energy of the phases into the energy of gases. Furthermore, environmentally sound role modeling goes in the same direction [28]. Teachers act as role models in providing examples of environmentally sound learning attitudes and behaviors [29].

Figure 1. The teacher becomes a role model by practicing reuse, reduce, and recycle

Besides teachers, almost everyone in this boarding school can serve as a model for others, either teacher to students, students to other students, even students to teachers. Some modeling seems unintentional, for example, an ecologically-minded student picks up trash from space and puts it into a trash bin by habit. However, some modeling is sometimes intentional. A student explains that she is sometimes motivated to engage in environmentally friendly behaviors because she wants other students and teachers to imitate her. Therefore, modeling techniques among leaders, teachers, and students positively influence one another.

The data concluded that parenting and perceived similarities with students are two of the strongest predictors of modeling success [8]. Students are more likely to emulate a warm, affectionate, and perceived model identical to themselves in some way. The level of student-teacher (*santri-ustadz*) relationship that is the norm in *pesantren* shows this upbringing, warmth, and affection. At Islamic Boarding School Sumber

Mental Agama Allah (SPMAA) *eco-pesantren*, many students claim that teachers are their friends and mentors, and some are even likened to parents. The close relationship between *santri* (student) and *ustadz* (teacher) seems to strongly influence the effectiveness of modeling individual roles. Teachers and students talk about how these relationships benefit their sustainability modeling efforts. Practicing environmental education behavior is a prerequisite for effective modeling of environmental education, while the close *santri-ustadz* relationship seems to improve the results of sustainable role modeling.

3.2. Facilities and infrastructure

The aspect of facilities and infrastructure and how they operate can serve as a solid medium to teach students about sustainability [30]. *Eco-pesantren* has made prominent efforts to decrease negative impacts on environment and increase positive impact on their institutions by benefiting their facilities based on eco-friendly principles 3R a promising model to provide environmentally friendly boarding school facilities [31]. These efforts include: creating energy with photovoltaic panels, solar water heaters, and a wind generator; building a wetland park that naturally moves down all wastewater, including human waste, collecting and storing rainwater from the rooftop, and instituting minimal water consumption, such as bathing with a navy shower, a shower that could stop running when we do not need during applying soap to body; allowing natural cooling of the building using indoor plants; and creating experimental buildings made of wood from heavily acquired trees and reconditioned scrap materials. Keeping infrastructure means unsuring the physical system of *pesantren* functions well, including facility maintenance, fieldwork, waste management, cooking, and cleaning.

Interestingly, *santri* and *ustadz* in *eco-pesantren* and SPMAA Lamongan are responsible for *eco-pesantren* infrastructure. In *eco-pesantren*, none employs auxiliary staff. Instead, the students and *ustadz/musyrif* function as guardians of cottages or madrasah. They clean, pick up garbage, recycle, care for gardens, do composting, prepare food, and care for livestock belonging to *eco-pesantren*. Students are responsible for about 30 minutes of daily tasks and longer work projects of regular facility maintenance and gardening. The most common reason cited by cottage leaders for greening the facility and its operationalization is to model environmentally sound education for the students.

Orr [32] stated that, "physical buildings contain their hidden curricula that teach as effectively as any subject taught in them. We do not consider academic buildings as pedagogical, but in fact, they are." Transparency in building Islamic boarding school facilities and operations is crucial to making *pesantren* facilities an effective learning medium as shown in Figure 2. SPMAA Lamongan ensures that the ecological, social, and economic impacts of the facility and its operation are evident to students and others. At SPMAA Lamongan, teachers describe the efforts of afforestation as a teaching tool. Some interviewees witnessed it more effective.

Figure 2. Outbound mentoring activities in and with nature

In addition to making green facilities transparent, the operations are also provided transparent to students. It involves students in *pesantren* operations, such as making waste, consumption sharing, avoiding injustice, embracing good governance, and making the economy of *pesantren* more visible and natural. The involvement of students in the operation of infrastructure lets them have a sense of ownership and responsibility for the place and cottage. Its eco-friendly facilities and operations promote environmentally sound education by modeling environmentally friendly practices, reducing the need to reproduce lectures to students, creating a context for conversations on environmental conservation issues, providing hands-on opportunities to try environmentally friendly practices, and enhancing students' sense of belonging and environmental management.

3.3. *Pesantren* education governance system

Pesantren governance system aims to model social justice [33]. Correspondingly, SPMAA Lamongan adopts the governance to model social justice and community participation. The students in this *pesantren* learn about social justice through modeling a participatory process. Students, parents, and teachers, together with the leaders and administrators of the *pesantren* make integrated policies, so the decisions of the *pesantren* can be understood and implemented collectively.

The governance of SPMAA Lamongan, in decision-making, involves leaders, students, parents, and community teachers. Besides modeling inclusive decision making, governance structures in this *pesantren* also help students build a sense of ownership [34]. Participatory governance structure in *pesantren* promotes students' sense of belonging to *pesantren* and prepares students for participation in a democratic society.

3.4. Culture of educational institutions

Culture exerts significant effects on people's actions and ideas, thus making it a powerful learning medium [35]. It is a pattern of shared values considered valid among certain community [36]. *Pesantren* culture is realized through *pesantren* rituals, traditions, buildings, programs, teaching methods, and extracurricular activities [1]. Although *pesantren* may not be able to change the culture outside *pesantren*, in the short term at least, it can make their culture support environmentally friendly education. Some rituals and traditions support environmentally sound education [35].

Every morning, all the students and teachers in SPMAA Lamongan gather at the mosque for the congregation's dawn prayers. Some lectures discuss topics related to the environment, simple living, awareness of protecting nature, personal growth, community, and social justice. In addition, SPMAA fosters a culture of sustainability through tradition. Every morning, all students, teachers, and employees go out of the cottage for a morning exercise, such as jogging and practicing yoga. At the end of the semester, they hold a semi marathon. This ritual promotes teamwork, perseverance, and connection to the natural world. By instilling sustainability values, teachers and students are highly supportive towards sustainability.

Creating an environmentally friendly culture, *eco-pesantren* offers students an alternative of cultural models they may experience outside [37]. The norms and values that promote practices that are not environmentally friendly are so ingrained in the culture of Indonesian society that imagining a more environmentally friendly culture among a community could be difficult. When ingrained in society, culture will not quickly shift. A culture that does not support eco-friendliness can thus present real challenges to an environmentally sound education. Building a supportive culture can be a considerable challenge, and boarding schools must be aware of how their culture can hinder the environmentally sound education effort. However, the effects of a thriving cultural shift can be invaluable.

Cultural impregnation and widespread acceptance within a community can make it one of the most potent ways to encourage and model environmentally sound education goals for all community members. Besides, cultures that support environmentally sound education are more likely to promote modeling using other means since individual behavior, its means and practices, operations, and school governance can express cultural norms in *pesantren* on its way. One of the main ways of *eco-pesantren* to achieve this consistency is promoting school culture [23], since it shapes a behavior in the individual sphere, the use of facilities, and the school governance. The cultural shifts, partly promoted by traditions, rituals, and ceremonies, trigger behavioral changes.

4. CONCLUSION

Eco-friendly education by modeling techniques constitutes four main points: individual role models; infrastructure and their use; government systems; and cultures or traditions of educational institutions. The modeling techniques allow Islamic boarding school to encourage learning environmentally friendly behaviors by practice. Students learn by direct and continuous observation. They forge knowledge by application rather than theoretical insights about environmentally sound education values. Therefore, they might accept and adopt those behaviors. Modeling can assist students to manifest the eco-friendly ideas into actual implementations. Direct observation of regular practices complete students with the knowledge needed to perform the behavior. Public may hope that students who have witnessed the environmentally friendly practices live are better prepared to lead a more sustainable lifestyle.

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