p-ISSN 2355-5343
e-ISSN 2502-4795
http://ejournal.upi.edu/index.php/mimbar

Article Received: 30/10/2024; Accepted: 02/01/2025
Mimbar Sekolah Dasar, Vol.12(1),21-36
DOI: 10.53400/mimbar-sd.v12i1.81618

# An Exploration of Pro-Environmental Values in Learning: A Case Study in Elementary Schools

**Rintoni✉[1], Kama Abdul Hakam[2], Suroso Adi Yudianto[3] & Warlim[4]**

[1,2,3,4] General Education and Character Program, Universitas Pendidikan Indonesia, Bandung, Indonesia

✉ rin.toni@upi.edu

**Abstract.** Pro-environmental values are crucial to instill in students to foster a generation that cares about the environment, promoting sustainability through education. Teachers play a central role in developing students' morals, encouraging responsible behavior and pro-environmental attitudes. This study explores pro-environmental values in ecology learning, focusing on ecosystem balance and the potential for more effective ecological education. Conducted at an elementary school in Subang Regency, West Java, it involved teachers and sixth-grade students. Using a qualitative case study approach, data was collected through observation, interviews, and discussions with 21 respondents, including principals, teachers, and students. Analysis followed stages of data collection, reduction, display, and conclusion. The study identified six key pro-environmental values taught: 1) environmental education, 2) energy-saving and renewable energy, 3) waste reduction, 4) anti-consumerism, 5) recycling, and 6) nature conservation. These values enhance students' capacity to act sustainably, fostering environmentally friendly behavior and responsible character. The findings underscore the importance of integrating pro-environmental values into ecological teaching to build environmentally conscious students. This study contributes to understanding how ecological learning materials can effectively promote sustainability, equipping teachers with tools to nurture environmentally aware future generations.

**Keywords**: Elementary School; Environmental Sustainability; Ecology Learning; Pro-Environmental Values; Sustainable Behavior.

## 1. Introduction

The current concern over individual attitudes toward the environment is alarming, with numerous scientists identifying anthropogenic environmental degradation as a paramount contemporary threat (Bouman, Steg, & Zawadzki, 2020; Hilbig, Zettler, Moshagen, & Heydasch, 2013; Klein, Hilbig, & Heck, 2017; Soutter & Mõttus, 2020). Therefore, UNESCO defines education as a means to encourage sustainable development, enabling individuals to acquire the knowledge, skills, attitudes, and values necessary to shape a sustainable future (UNESCO, 2016). Instilling pro-environmental attitudes and values in students is a concrete effort to promote behaviors that protect, preserve, and develop the environment both locally and globally. However, initial studies of learning outcomes reveal a gap between educational goals and real-world behavior, as students often lack respect for the natural environment. This is evident in their disregard for classroom and school cleanliness, littering, and indifference to dirty surroundings.

A plausible explanation for such behavior is humanity's failure to recognize how meeting short-term needs jeopardizes long-term economic growth and environmental sustainability (Kakoty, 2018). Global environmental issues, such as global warming, climate change, and environmental degradation, pose significant threats to human life (Bouman et al., 2020; Hilbig et al., 2013; Klein et al., 2017). According to the Global Carbon Report (2019), global fossil CO2 emissions continue to rise annually, contributing to increasing Earth temperatures and global disasters (Álvarez-Yépiz, 2020; Keraf, 2010; Phun et al., 2020; Soutter & Mõttus, 2020). Local environmental problems, such as floods, landslides, and waste management, further exacerbate the situation, highlighting the detrimental impact of human behavior (Janmaimool, 2016; Mulyadi, 2018; Sumaatmadja, 2012; Yu, Yang, & Li, 2018).

Given these challenges, education plays a pivotal role in fostering positive environmental change. Schools must develop students with pro-environmental character by integrating materials that emphasize pro-environmental values. Such education enhances students' capacity to act responsibly and live in harmony with the environment (Chen, Yang, & Chen, 2023). This study explores pro-environmental values in students through ecological learning, focusing on the aspects teachers emphasize to develop these values. Understanding these efforts is crucial, as students with pro-environmental values contribute to environmental sustainability through their attitudes and behaviors.

### 1.1. Problem Statement

Behavior that reflects pro-environmental values is beginning to fade due to widespread public skepticism (Soutter & Mõttus, 2020). This issue is closely tied to the educational process, which has so far been criticized for lacking the emphasis needed to foster ethical and environmentally sustainable behavior (Barkowitz, Battistich, & Bier, 2008; Williams, Yanchar, Jensen, & Lewis, 2003). Economic motives and other self-interests that prioritize human desires over environmental concerns further exacerbate the loss of awareness regarding environmental sustainability (Ali & Anufriev, 2020; Barkowitz et al., 2008; Bouman et al., 2020).

One of the efforts teachers can make to strengthen students' environmentally conscious character is to instill pro-environmental values through school learning. Teachers play a crucial role in educating students by employing various strategies, such as providing in-depth knowledge about the importance of environmentally friendly behavior. This approach helps cultivate environmental awareness, which is essential for building a generation that cares about the environment.

### 1.2. Related Research

Several studies related to developing students for environmental sustainability have been explored. For example, Sieg & Dreesmann (2021) examined pro-environmental behavior by maintaining skeletons as a way to educate about environmental care, specifically biodiversity preservation. However, this study did not link pro-environmentalism to ecological material in classroom learning. Similarly, Donmez-Turan and Kiliclar (2021) analyzed pro-environmental behavior by studying the ecological world through environmental training. Their findings revealed that ecological studies and environmental knowledge can encourage students to behave pro-environmentally. However, further research is needed to explore strategies and the role of teachers in teaching environmental knowledge to strengthen students' pro-environmental behavior. Another study by Betawi (2020) investigated the importance of character education in improving students' moral integrity. The results showed that character education enhanced moral integrity across four dimensions: honesty, empathy, courage, and respect. However, the study did not focus on increasing students' pro-environmental moral values; it only supported the idea that character education can strengthen students' overall character.

### 1.3. Research Objectives

This research aims to explore several aspects of pro-environmental values taught by teachers in ecological learning on the theme of ecosystem balance. This is an important study because teacher strategies in teaching pro-environmental values determine students' character and will have an impact on the sustainability of the school environment and society through their attitudes and behavior.

## 2. Theoretical Framework

Pro-environmental values are seen as a blend of personal interests (such as pursuing strategies to minimize one's health risks) and concern for others (socially), future generations, other species, or the entire ecosystem (for example, preventing air pollution that can pose health risks to others and/or the global climate) (Bamberg & Möser, 2007). Environmental issues are not merely technical problems; the global ecological crisis we face today is a moral and behavioral issue (Ardoin, Bowers, & Gaillard, 2020; Berkowitz, Ford, & Brewer, 2005; Briggs, Trautmann, & Phillips, 2019; Keraf, 2014). Numerous environmental cases, both nationally and

globally, stem largely from irresponsible human behavior, a lack of concern for the environment, and a tendency toward self-interest (Bamberg & Möser, 2007; Cheng, 2019).

A pro-environmental attitude and behavior must be instilled in our younger generation. The love and care for the importance of the environment as a life support system for humans must be continuously promoted. This can begin by changing people's perspectives on how they treat the environment (Chwialkowska, Bhatti, & Glowik, 2020; Daryanto & Song, 2021; Donmez-Turan & Kiliclar, 2021). The old human perspective that views humans as the center of the universe and that only nature has value (Anthropocentrism) must be shifted to the Biocentric and Ecocentric paradigms, which view humans as biological and ecological beings, not merely social creatures, and nature as something separate from humans.

According to Kaiser, Oerke, and Bogner (2007), these aspects include a) energy conservation, related to behaviors aimed at saving energy. b) Mobility and transportation are related to behaviors aimed at using transportation effectively and efficiently. c) Waste avoidance, related to behaviors aimed at avoiding waste, such as minimizing the use of plastic. d) Recycling, related to behaviors and actions aimed at recycling used materials. e) Consumerism, related to behaviors aimed at choosing and using environmentally friendly products, such as choosing organic products, using natural materials to control pests, etc. f) Conservation, related to behaviors and actions that generally do not harm the surrounding environment.

The fundamental challenge in inculcating pro-environmental values lies in the lack of understanding regarding the importance of the environment to life and its impacts on all aspects of human life (Ateş, 2020). This low level of understanding renders pro-environmental values insignificant (Maurer & Bogner, 2020), leading to the neglect of the importance of the school environment and its community in creating a school with a healthy natural ecosystem, proper waste management, and a clean school environment as a representation of pro-environmental attitudes and behaviors. Exemplary behavior is crucial in instilling values (Arthur, 2008; Kristjánsson, 2013; Lickona, 1991; Sauri, 2018) as teachers and educators set a good example that will be observed and imitated by students as good, valuable, and meaningful actions (White, 2015).

Ecology is a branch of biology, a science that studies the relationship between living organisms and their environment, as well as the life systems within it (Campbell, Urry, Cain, Wasserman, & Minorsky, 2017). Ecology education should not merely explain facts and environmental data but must be able to provide an understanding of the environment and how to behave responsibly to shape pro-environmental individuals (Hutcheson, Hoagland, & Jin, 2018) by considering the environment as something important to protect and preserve, and by presenting environmental issues that must be addressed wisely. Pro-environmental behavior is important to demonstrate awareness of environmental issues and how to uphold social norms and values in protecting the environment (Bamberg & Möser, 2007). The lack of knowledge regarding the importance of building a relationship between humans and their environment, which shapes non-pro-environmental behavior, becomes the fundamental problem. Ecological knowledge is expected to become a paradigm of thought and a supplement in shaping attitudes and subsequently become a foundation for behavior.

Environmental education taught in elementary schools is very important for the basic knowledge of students in getting to know their environment, and classroom teaching practices carried out by teachers must be promoted in the use of comprehensive material. The material taught to students provides the initial knowledge base that will be used by students in their lives when it comes to his environment, support from schools in the form of policies and creating a culture in schools and existing resources in schools that focus on improving attitudes, skills and environmental values in children must continue to be applied consistently (Díaz, Camarena Gómez, González Lomelí, & Mirón-juárez, 2021).

The role of teachers as disseminators of environmental content in schools involves transmitting knowledge and teaching concepts about environmental conservation that are oriented toward understanding environmental problems and environmental awareness. This updates concepts of the environment, norms, and even legal studies related to the environment (Aedo,

Peredo, & Schaeffer, 2019). Teachers also play a crucial role in developing students' environmental literacy. Inadequate teacher training and development causes problems related to the implementation of environmental education in schools. Therefore, one of the major challenges faced today is to strengthen professional development for teachers. Teachers, as active agents, have the task of building knowledge and creating meaningful understandings in learning (Coyle, 2018). Teachers' experience in classroom teaching practices also becomes important in supporting success in achieving learning objectives (Choi, 2019).

## 3. Method

### 3.1. Research Design

The approach used in this study is a qualitative approach with a case study research method (Julia, Supriyadi, & Iswara, 2022). This study was conducted in one of the elementary schools in Subang Regency, West Java Province, Indonesia. In this case, people, students, or school staff who are part of the school community can be selected (Creswell, 2011). This case study research was conducted in elementary schools, focusing on describing classroom learning, and then data was collected objectively according to the original conditions. This design is relevant to the context of this research because it tries to explore ecological learning in the classroom in-depth and examine teachers' efforts to teach pro-environmental values in the classroom to encourage students to have environmentally friendly attitudes and behaviours and is studied more widely on the potential for further ecological learning that is more ideal.

### 3.2. Participant

The subjects of this study were the headmaster, elementary school teachers, and sixth-grade students of elementary school. The data collection process was carried out in stages, starting with observations and ending with interviews and discussions involving 21 respondents: the headmaster, teachers, and students.

### 3.3. Data Collection and Analysis

Data analysis was carried out from the beginning of the study, namely when data was collected through observation and field notes, interviews, and discussion results (Anam, I Nyoman, Murtadho, & Kuswandı, 2019). Initial data collection was the result of classroom learning observations. Furthermore, data was collected through interviews with the headmaster, teachers, and students involved in the learning process; then, the data was analyzed continuously. Data analysis was done through the display process, data reduction, and conclusion. The collected data became the basic framework for compiling research results on teacher strategies for strengthening environmentally conscious characters in schools.

## 4. Findings

The findings of the research exploring pro-environmental values in ecology learning by paying attention to learning materials and learning activities carried out by teachers, based on observation results, show that the pro-environmental aspects taught by teachers in ecology learning are arranged in the following Table 1.

**Table 1.** Research Findings on Aspects of Pro-Environmental Values in Each Learning Material and Learning Activities

| Learning Materials | Learning Activities | Pro-Environmental Value Aspects |
|---|---|---|
| The concept of ecosystem and the components that arrange it | The teacher explains the importance of ecosystems in maintaining natural balance, which will affect the preservation of nature itself and will have an impact on human life. | Nature conservation |

| | | |
|---|---|---|
| Correlation among component ecosystem | The teacher explains the correlation between humans and their environment and its impact on human life. Therefore, humans, as subjects in nature, are required to have good relationship behavior with nature. | Nature conservation |
| | The teacher gives an example of bad human behavior (throwing rubbish carelessly, which causes flooding), so the teacher encourages them to always be wise in managing waste (using unused items), using environmentally friendly items, and reducing the use of disposable plastic items. | Reducing waste, Recycling, and Consumerism |
| Cycles that take place in nature to maintain the balance of nature | The teacher explains the basic concept of cycles that take place in nature to maintain natural balance, which, in principle, will be utilized by humans. | Nature conservation |
| Correlation between component biotic and abiotic, as well as a connection between biotic and biotic in the ecosystem, then link it up with an imbalance environment. | The teacher explains the correlation between the biotic and abiotic components, as well as the connection between biotic and biotic components in the ecosystem, and then links it up with an imbalanced environment. | Nature conservation |
| Possible actions that can be taken to restore environmental imbalance | Students explain the important steps taken to restore environmental imbalances, namely wisely managing waste, planting trees, and efficient use of energy. | Energy saving & Renewable Energy, nature conservation, reducing waste, and recycle |
| Interaction in ecosystem and energy flows as well as their benefit and impact on life. | The teacher provides a concluding explanation (after the student presentation) regarding the importance of using energy from nature and emphasizes the importance of using energy efficiently. | Energy saving & Renewable Energy |
| Biogeochemical cycles and their benefits also impact life | Students presented biogeochemical processes and their benefits for life, one of which was encouraging energy saving. | Energy saving & Renewable Energy |
| Environmental imbalance and predicting possible unbalanced processes | The teacher explains the possibilities that could occur if something doesn't happen balanced environment. Some of these include flooding and global warming. | Nature conservation |
| Processing data on various components of the ecosystem and linking it with a balanced ecosystem that exists | Students make observations and presentations about the ecosystem they observe and relate it to ecosystem imbalance. | Nature conservation |

| | | |
|---|---|---|
| Processing data on various ecosystem components and relating them to the existing ecosystem balance | Students explain the conclusions obtained from the learning, namely the benefits of learning include maintaining natural balance and the importance of energy. | Nature conservation |
| Conclude that in nature, there is a balance between biogeochemical components and processes. | Students conclude that efforts must be made to address damaged nature (due to an imbalance in the ecosystem), such as planting trees and disposing of rubbish in its proper place. | Conservation of nature and reducing waste |

Based on the research results on the Table 1, there are eleven learning materials and learning activities delivered to students, all of which are divided into several aspects based on pro-environmental values. The aspects found are 1) energy-saving and renewable energy, 2) nature conservation, 3) consumerism, 4) reducing waste, and 5) recycling.

Next, the researcher conducted in-depth interviews with respondents regarding ecology learning regarding what aspects of values are contained in ecology learning in the classroom. Based on the interview results, it was stated that ecology learning contains various aspects of values that are important to be taught, understood, and applied in community life. The following are some aspects of values contained in the learning: 1). Understanding the importance of maintaining ecosystem balance encourages individuals to care more about their environment, such as planting trees and caring for plants at school (environmental conservation), 2). Teaching the importance of utilizing natural resources wisely so that they can be enjoyed by future generations, such as saving water and electricity and campaigning for the importance of natural resources (saving energy and renewable energy and environmental conservation), 3). Explaining how all components of the ecosystem depend on each other, thus fostering a sense of mutual respect and appreciation (environmental conservation), (4). Fostering awareness of individual and collective responsibility in maintaining environmental sustainability (environmental conservation), 5). Encouraging creative thinking to find solutions in maintaining ecosystem balance, including the use of environmentally friendly technology (energy saving & renewable energy), 6). Strengthening moral and ethical values in interacting with nature, including the need to respect all forms of life (environmental education), 7). Raising awareness that ecosystem damage can impact communities and society, making it important to contribute to conservation efforts (environmental education and environmental preservation), 8). Teaching the importance of adapting to changes that occur in the ecosystem and being prepared for environmental challenges (environmental education).

Researchers discuss the importance of teaching ecology with a focus on the challenges and opportunities faced in the era of globalization. The following are the results of the discussion on what ecology needs to be taught in the future: 1). Understanding how activities in one part of the world can affect ecosystems in other parts, including issues such as international trade and the impacts of climate change (environmental education), 2). Teaching about different cultural perspectives on the environment and how local values can contribute to ecosystem conservation (environmental education), 3). Raising awareness about the impacts of globalization that are accelerating climate change and how communities can adapt and reduce their carbon footprint (environmental education), 4). Techniques that consider global needs without compromising local balances, including sustainable agriculture and responsible fishing practices (environmental conservation), 5). Introducing new technologies that can help preserve the environment, such as renewable energy solutions, efficient waste management systems, and biotechnology for ecosystem restoration (renewable energy, waste prevention, environmental conservation), 6). Promote understanding of the moral responsibility to safeguard global ecosystems, including issues of environmental justice and human rights (environmental education), 7). Encourage participation in global and local environmental movements and the use of social media to raise awareness and collective action

(environmental education), 8). Teach adaptation strategies to address environmental challenges arising from globalization, including natural disasters and changing weather patterns (environmental education), 9). Integrate environmental science with other fields, such as economics, sociology, and politics, to understand the holistic impacts of decisions made at the global level (environmental education).

Based on the results of observations, interviews and discussions, many pro-environmental values were found in ecology learning in schools, but researchers categorized them into six aspects, the six aspects are shown in the Figure 1 below:

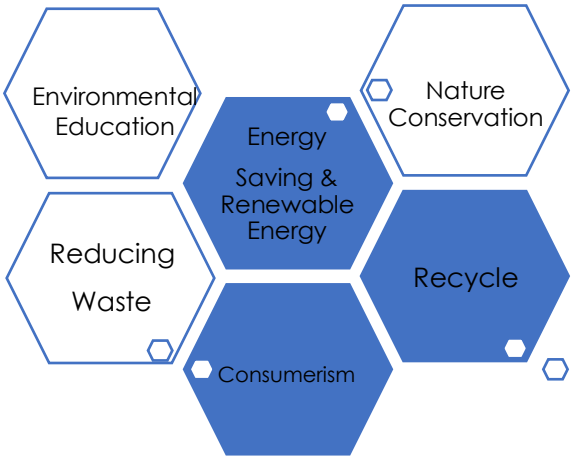


**Figure 1.** Pro-Environmental Value Aspects

The Figure 1 explains the results of this study, and based on the results of observations, interviews and discussions, the results of the study were found to be six categories of aspects of pro-environmental values in ecological learning. The six aspects are 1) environmental education, 2) energy-saving and renewable-energy, 3) reducing waste, 4) consumerism, 5) recycling and 6) nature conservation.

## 5. Discussion

The results of the study found that ecological learning in the sub-theme of ecosystem balance in schools not only teaches material cognitively but also teaches pro-environmental values that are important for students' lives and to be applied in their lives to become attitudes and behaviors that are in line with environmental sustainability, several aspects of which include environmental education, saving energy and renewable energy, waste prevention, recycling, consumerism, and nature conservation. This is in line with what Hatchenson said that teaching ecology is teaching not only knowledge but also moral values and encouraging ethical attitudes and behavior toward the environment (Benjaminsen & Svarstad, 2019; Hutcheson et al., 2018) very important for a sustainable future (Liu & Green, 2024). So that efforts to teach values in schools to the younger generation can be realized to make individuals who have moral-ecological awareness; environmental responsibility is manifested in the development of attitudes and responsibilities towards oneself and others, and environmental volunteerism is a person's assessment and control of themselves and others (Ruziyeva, 2024).

Learning that contains values in schools is a form of implementation of character education in schools; the process of teaching pro-environmental values or ecological values by teachers to students is a form of crystallization of ecological values to students in shaping student character. Character education emphasizes the development of strong moral, ethical, and personality values. The goal is to form individuals who are not only academically intelligent but also have integrity, empathy, and responsibility by internalizing positive character values that can form a good person with an attractive, ethical, humble, honest, intelligent, caring, and resilient personality (Baderiah & Munawir, 2024; Gustina, 2024; Kartika, Asnur, & Sumoukil, 2021), this is in line with the development of pro-environmental values to students to increase

awareness, concern and responsibility for environmental sustainability. The development of environmental education values can be done through ecological learning, helping the younger generation understand the environmental problems around them. With adequate knowledge, they can realize the impact of daily actions on the environment. This awareness is important to form attitudes and behaviors that are more caring and responsible for the environment. Character education is an absolute that must be applied in schools in all aspects and activities in schools (Muhammad, Suhaimi, Zulfikar, Sulaiman, & Masrizal, 2021; Murwaningsih, Fadhilah, & Sholeh, 2020).

In learning ecology in elementary schools, the first aspect taught by teachers is environmental education. Environmental education is teachers training students to learn about ecological values as a form of instilling pro-environmental values, and with environmental education, students are taught to think critically about environmental issues. They are trained to analyze information, evaluate data sources, and make wise decisions. These skills are not only useful in the environmental context, but also in various other aspects of life in building a sense of togetherness and social responsibility. Moreover, according to Baderiah and Munawir (2024), students are expected to behave and act correctly in line with the knowledge they have. Environmental education prepares the younger generation to become leaders who care about the environment. With good knowledge of environmental issues, they can create sustainable policies and solutions to the challenges faced by society. Leaders who have environmental awareness will be better able to address issues related to sustainability because, according to Liu and Green (2024), to face the enormous environmental challenges that the earth is currently experiencing, people need to adopt more pro-environmental behaviors, especially a deeper understanding of children's experiences, attitudes, and behaviors towards the environment is essential for a sustainable future. The second aspect taught by teachers to students is energy saving and renewable energy. Teachers teach students about energy saving and renewable energy attitudes and behaviors, which are views or mindsets that encourage individuals to use energy efficiently and responsibly because, according to Carrus et al. (2021), positive attitudes towards environmental issues are closely related to behavioral intentions in the same domain. This can be achieved in various ways, such as reducing electricity use, utilizing renewable energy sources, and increasing awareness of the importance of energy conservation. Energy-saving behavior can start from small things, such as turning off lights when not in use, using efficient electrical equipment, and utilizing natural light. Therefore, it is necessary to underline the need to change our energy consumption behavior not only individually but also collectively (Carrus et al., 2021). From an environmental psychology perspective, addressing climate change requires a deep understanding of the psychological processes in pro-environmental behavior and lifestyles in general and encouraging wise energy consumption (Clayton, 2020; Hartig, 2020).

The implementation of energy-saving and renewable energy attitudes is not only beneficial for individuals but also for the wider community. By using energy wisely, we can reduce electricity bills and save expenses. In addition, reducing energy consumption also contributes to reducing greenhouse gas emissions, which are very important for protecting the environment and addressing climate change. Even according to Carrus et al. (2021), the implementation of energy-saving solutions or "low carbon" technologies (such as renewable energy sources) fails to translate these values, beliefs, and attitudes into practical actions in their daily life choices. Therefore, it is important to systematically implement pro-environmental value-based learning as a form of support for energy-related values and behaviors. In fact, if necessary, carry out an intervention to further encourage energy-saving behavior (Du & Pan, 2021). Teachers and schools have the authority to make rules in schools as interventions to encourage energy-saving and renewable energy behaviors. The third aspect is waste prevention efforts. Teachers teach, provide examples, and encourage students to make efforts to prevent waste behavior at school, such as disposing of garbage in its place and managing waste properly. Amidst increasingly complex environmental challenges, waste management is one of the main issues that needs serious attention, especially in schools. Waste generated from human activities, be it household waste, industrial waste, or agricultural waste, has great potential to pollute the environment and endanger human health (Baldé, Forti, Gray, Kuehr, & Stegmann, 2017).

Individuals and communities can take several actions to prevent waste. First, reduction is the most effective initial step. Individuals can start by reducing the use of single-use products, such as plastic bags, water bottles, and food containers. Choosing products that can be reused or have environmentally friendly packaging is a wise step. Second, recycling is another way to prevent waste. By sorting waste at home and encouraging recycling practices, we can reduce the amount of waste that goes to landfills. Third, composting is a very useful method for processing organic waste, such as food scraps and garden waste, but it also produces natural fertilizer that can be used for plants (Batistela dos Santos et al., 2022). Attitudes and behaviors to prevent waste are important steps in maintaining environmental health and ensuring the sustainability of natural resources. By reducing, recycling, and composting, we can contribute significantly to waste reduction (Sundin et al., 2024). Education and public awareness of the importance of preventing waste are very effective in encouraging waste reduction actions to be implemented properly (Balzaretti et al., 2020).

The fourth aspect of pro-environmental values taught by teachers is the recycling aspect. Recycling is the process of converting waste materials into new products, which not only reduces the amount of waste produced but also helps save natural resources. By recycling, we can reduce the need for new raw materials, save energy, and reduce greenhouse gas emissions. In addition, recycling also contributes to reducing pollution resulting from the production process of new goods. However, waste prevention is prioritized over recycling and seeks to reduce the amount of waste, hazardous substances, and their impact on the environment (Jeschonowski-Papstein, Gast, Binding, & Faulstich, 2024).

In many countries, the problem of waste is the initial trigger for people to recycle (Jeschonowski-Papstein et al., 2024). People are beginning to understand that by recycling, they are not only contributing to maintaining a clean environment but also helping to create a more sustainable economy because, according to Jadhao, Ahmad, Pant, and D. P. Nigam (2022), recycling has minimized the impact of damage to the environment. Recycling is part of a more environmentally conscious lifestyle, where individuals strive to minimize their ecological footprint. One effort that can still be made is waste remediation technology (Chakraborty et al., 2022). Implementing recycling behavior in everyday life can be done in several ways. First, start by sorting waste at home and collecting recyclable materials, such as paper, plastic, glass, and metal. However, the recycling process carried out by the factory has a negative impact on the residue (Baldé et al., 2024), although not all factory recycling processes. This is a dilemma, but at least our good intentions in managing waste to recycling efforts can be considered as a love for the environment. Second, use products made from recycled materials. Third, get involved in local recycling communities or programs.

The fifth aspect taught by teachers to students is the aspect of consumerism. Consumerism refers to the attitudes and behavior of individuals or groups in consuming goods and services, which are often excessive and not always based on real needs. This phenomenon has a significant impact, both positive and negative, on individuals, society, and the environment. One of the negative impacts of excessive consumption is the real environmental damage from the mass and global use of plastic that prioritizes practical values without considering sustainability efforts (Fogt Jacobsen, Pedersen, & Thøgersen, 2022); there needs to be a joint effort to find sustainable solutions to reduce the great pressure on natural resources (Abulibdeh & Zaidan, 2020; Newell, Twena, & Daley, 2021). Consumerism is often triggered by a culture of materialism, where success and social status are measured by what is owned. This phenomenon not only drains personal finances but also causes increased waste and negative impacts on the environment. The excessive production of goods contributes to the exploitation of natural resources and increased pollution (Baldé et al., 2024).

However, consumerism can also have a positive side. In an economic context, the consumption of goods and services can drive economic growth, create jobs, and increase innovation. When people actively shop, they support local and global industries. In addition, responsible consumerism can encourage companies to produce more environmentally friendly and sustainable products, in line with increasing consumer awareness of environmental issues. Research shows that unsustainable consumption is also exacerbated by denial, self-esteem, and social and cultural influences (Alvi, Hoang, & Naeem Nawaz, 2024).

The sixth aspect of pro-environmental values taught by teachers is the aspect of nature conservation. Nature conservation is an effort to maintain and preserve the environment and natural resources so that they remain balanced and sustainable. Damage to nature has a very large impact on human life and the ecosystem. Environmental issues have become a hot topic of discussion and an important factor in ensuring a better quality of life in the future (Abbass et al., 2022; Calculli, D'Uggento, Labarile, & Ribecco, 2021). In a broader context, individual and societal consumption also causes environmental degradation directly and indirectly. By choosing organic products, consumers support agricultural practices that avoid pesticides, herbicides, and synthetic fertilizers, there by maintaining soil health and biodiversity (Mohd Suki, Majeed, & Mohd Suki, 2022). In addition, almost all countries, especially developing countries, face environmental challenges, including Indonesia (Tamara, 2021). Environmental issues are many and varied, including global warming, high levels of pollution from industrialized countries, legal and illegal deforestation, water pollution, overpopulation, and loss or degradation of biodiversity (Elisha & Felix, 2020; Shivanna, 2022), but several factors of conservation behavior among individuals and households indicate that motivational, psychological, environmental attitudes, values and concerns, and socioeconomic characteristics are important factors in conservation behavior (Long et al., 2023; Poškus, 2020; Singha, Karmaker, & Eljamal, 2023). To maintain the sustainability of nature, concrete and sustainable steps are needed. First, public education and awareness about the importance of nature conservation must be increased. Second, the application of environmentally friendly technologies in industry and agriculture can reduce negative impacts on nature. Third, the government also has an important role in nature conservation. Policies that support environmental protection, such as law enforcement against environmental violations, development of conservation areas, and incentives for environmentally friendly practices, must be implemented consistently. Nature conservation efforts that are carried out require encouragement from the subjective and normal values of each individual (Alvi et al., 2024).

Ecological learning contains many pro-environmental values and six aspects, namely environmental education, energy saving and renewable energy, waste prevention, recycling, consumerism, and nature conservation. A teacher must convey the six aspects of pro-environmental values in ecological learning in elementary schools to invite students to act and behave according to the six aspects above, as an effort to foster environmental awareness and behave in an environmentally friendly manner and support sustainability both in schools, families and communities as an effort to implement character education.

## 6. Conclusion

Pro-environmental values are very important values to be taught to students, especially when studying ecology. These values will give rise to knowledge, attitudes, and moral behavior by treating nature well, which has an impact on personal, social, and natural aspects. The results of exploration in ecological learning show that teachers teach and instill six aspects of pro-environmental values, namely 1) nature conservation, 2) energy saving & renewable energy, 3) recycling, 4) consumerism, and 5) reducing waste, and 6) environmental education. The process of instilling pro-environmental values can be carried out in any learning by linking six pro-environmental aspects that can be taught in class. Learning pro-environmental values should encompass teaching environmental sustainability and the impacts of environmental damage. Teachers instilling pro-environmental values in classroom teaching will be better if it is comprehensive (6 aspects) because it will increase the value capacity of students, and these values will equip students to behave in a friendly manner towards the environment because of the initial knowledge provided by the teacher to students, it will be an important basic capital for students to consider in behaving and acting towards the environment, carrying out good or bad behavior for the environment and knowing the impact on themselves and the social environment.

## Limitation

This study has limitations both in terms of the focus of the study, which only examines pro-environmental values conveyed by teachers related to the development of environmentally conscious characters, and the locus of the study, which was only conducted within the scope of one school in the Subang district.

## Recommendation

This study can be developed with a broader focus related to the development of environmentally conscious characters and others. Likewise, in terms of its locus, it can be conducted in several schools and several regions.

## Acknowledgments

This research did not receive grant funding from anywhere.

## Conflict of Interest

The authors declare that there is no conflict of interest.

## Declaration of Generative AI-assisted Technologies

This manuscript was prepared without the assistance of Generative AI. All intellectual contributions, critical analyses, and final revisions were conducted by the authors. The authors take full responsibility for the accuracy, originality, and integrity of the content presented in this work.

## References

Abbass, K., Qasim, M. Z., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research, 29*(28), 42539-42559. doi:10.1007/s11356-022-19718-6.

Abulibdeh, A., & Zaidan, E. (2020). Managing the water-energy-food nexus on an integrated geographical scale. *Environmental Development, 33*, 100498. doi:https://doi.org/10.1016/j.envdev.2020.100498.

Aedo, M. P., Peredo, S., & Schaeffer, C. (2019). From an essential being to an actor's becoming: political ecology transformational learning experiences in adult education. *Environmental Education Research, 25*(1), 33-45. doi:10.1080/13504622.2017.1408057.

Ali, E. B., & Anufriev, V. P. (2020). Towards environmental sustainability in Russia: evidence from green universities. *Heliyon, 6*(8), e04719. doi:https://doi.org/10.1016/j.heliyon.2020.e04719.

Álvarez-Yépiz, J. C. (2020). *Restoration ecology in the Anthropocene: learning from responses of tropical forests to extreme disturbance events* (Vol. 28). https://doi.org/10.1111/rec.13117.

Alvi, S., Hoang, V.-N., & Naeem Nawaz, S. M. (2024). Convenience orientation, environmental concerns and resource conservation behaviours. *Environmental Development, 52*, 101076. doi:https://doi.org/10.1016/j.envdev.2024.101076.

Anam, S., I Nyoman, S. D., Murtadho, N., & Kuswandı, D. (2019). The Moral Education and Internalization of Humanitarian Values in Pesantren: A Case Study from Indonesia. *Journal for the Education of Gifted Young Scientists, 7*(4), 815-834. doi:10.17478/jegys.629726.

Ardoin, N. M., Bowers, A. W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological Conservation, 241*, 108224. doi:https://doi.org/10.1016/j.biocon.2019.108224.

Arthur, J. (2008). Traditional Approaches to Character Education in Britain and America. In *Handbook of Moral and Character Education*. New York: Routledge.

Ateş, H. (2020). Merging Theory of Planned Behavior and Value Identity Personal norm model to explain pro-environmental behaviors. *Sustainable Production and Consumption, 24*, 169-180. doi:https://doi.org/10.1016/j.spc.2020.07.006.

Baderiah, B., & Munawir, A. (2024). Harmonizing Local Wisdom with Islamic Values: A Guide to Character Education Development. *International Journal of Asian Education, 5*(1), 63-75. doi:https://doi.org/10.46966/ijae.v5i1.374.

Baldé, C. P., Forti, V., Gray, V., Kuehr, R., & Stegmann, P. (2017). The global e-waste monitor. *United Nations University , International Telecommunication UnionInternational Solid Waste Association , Bonn/Geneva/Vienna*, 1-109. https://collections.unu.edu/eserv/unu:6341/GEM_2017-R.pdf.

Baldé, C. P., Kuehr, R., Yamamoto, T., McDonald, R., D'Angelo, E., Althaf, S., . . . Forti, V. (2024). International Telecommunication Union (ITU) and United Nations Institute for Training and Research (UNITAR). 2024. *Global E-waste Monitor*. http://collections.unu.edu/view/UNU:7737.

Balzaretti, C. M., Ventura, V., Ratti, S., Ferrazzi, G., Spallina, A., Carruba, M. O., & Castrica, M. (2020). Improving the overall sustainability of the school meal chain: the role of portion sizes. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 25*(1), 107-116. doi:10.1007/s40519-018-0524-z.

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology, 27*(1), 14-25. doi:https://doi.org/10.1016/j.jenvp.2006.12.002.

Barkowitz, M. W., Battistich, V. A., & Bier, M. C. (2008). What Works in Character Education: What Is Known and What Needs to Be Known. In *Handbook of Moral and Character Education*. New York: Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203931431-30/works-character-education-known-needs-known.

Batistela dos Santos, E., da Costa Maynard, D., Zandonadi, R. P., Raposo, A., Assunção Botelho, R. B. J. K. N., & Dietetics. (2022). Sustainability recommendations and practices in school feeding: a systematic review. *2*(2), 83-102. doi:https://doi.org/10.1159/000526379.

Benjaminsen, T. A., & Svarstad, H. (2019). Political Ecology. In B. Fath (Ed.), *Encyclopedia of Ecology (Second Edition)* (pp. 391-396). Oxford: Elsevier.

Berkowitz, A. R., Ford, M. E., & Brewer, C. A. (2005). A framework for integrating ecological literacy, civics literacy, and environmental citizenship in. *Environmental EducationAdvocacy: Changing Perspectives of Ecology*, 227. https://bioed.org/pubs/EE_chapter_berkowitz_et_al.pdf.

Bouman, T., Steg, L., & Zawadzki, S. J. (2020). The value of what others value: When perceived biospheric group values influence individuals' pro-environmental engagement. *Journal of Environmental Psychology, 71*, 101470. doi:https://doi.org/10.1016/j.jenvp.2020.101470

Briggs, L., Trautmann, N., & Phillips, T. (2019). Exploring challenges and lessons learned in cross-cultural environmental education research. *Evaluation and Program Planning, 73*, 156-162. doi:https://doi.org/10.1016/j.evalprogplan.2019.01.001.

Calculli, C., D'Uggento, A. M., Labarile, A., & Ribecco, N. (2021). Evaluating people's awareness about climate changes and environmental issues: A case study. *Journal of Cleaner Production, 324*, 129244. doi:https://doi.org/10.1016/j.jclepro.2021.129244.

Campbell, N. A., Urry, L. A., Cain, M. L., Wasserman, S. A., & Minorsky, P. V. (2017). *Biology* (Vol. 8): Pearson New York, NY, USA:.

Carrus, G., Tiberio, L., Mastandrea, S., Chokrai, P., Fritsche, I., Klöckner, C. A., . . . Panno, A. (2021). Psychological Predictors of Energy Saving Behavior: A Meta-Analytic Approach. *12*. doi:10.3389/fpsyg.2021.648221.

Chakraborty, S. C., Qamruzzaman, M., Zaman, M. W. U., Alam, M. M., Hossain, M. D., Pramanik, B. K., . . . Moni, M. A. (2022). Metals in e-waste: Occurrence, fate, impacts and remediation technologies. *Process Safety and Environmental Protection, 162*, 230-252. doi:https://doi.org/10.1016/j.psep.2022.04.011.

Chen, S., Yang, S., & Chen, H. (2023). Nonmonotonic effects of subjective social class on pro-environmental engagement. *Journal of Environmental Psychology, 90*, 102098. doi:https://doi.org/10.1016/j.jenvp.2023.102098.

Cheng, V. M. Y. (2019). Developing individual creativity for environmental sustainability: Using an everyday theme in higher education. *Thinking Skills and Creativity, 33*, 100567. doi:https://doi.org/10.1016/j.tsc.2019.05.001.

Choi, J. (2019). *How does learner-centered education affect teacher self-efficacy?The case of project-based learning in Korea* (Vol. 85). doi: https://doi.org/10.1016/j.tate.2019.05.005.

Chwialkowska, A., Bhatti, W. A., & Glowik, M. (2020). The influence of cultural values on pro-environmental behavior. *Journal of Cleaner Production, 268*, 122305. doi:https://doi.org/10.1016/j.jclepro.2020.122305.

Clayton, S. (2020). Psychologists' involvement in addressing climate change. *Appl. Psychol. Around World, 2*, 10-12. doi:10.4337/9781800371781.00010.

Coyle, D. (2018). *Knowledge ecology for conceptual growth: teachers as active agents in developing a pluriliteracies approach to teaching for learning (PTL)* (Vol. 21). doi:https://doi.org/10.1080/13670050.2017.1387516.

Creswell, J. W. (2011). *Controversies in mixed methods research*: The Sage Handbook of Qualitative Research.

Daryanto, A., & Song, Z. (2021). A meta-analysis of the relationship between place attachment and pro-environmental behaviour. *Journal of Business Research, 123*, 208-219. doi:https://doi.org/10.1016/j.jbusres.2020.09.045.

Díaz, G., Camarena Gómez, B., González Lomelí, D., & Mirón-juárez, C. A. (2021). A Structural Model of the Teaching Practice and Pro-Environmental Behavior in Elementary Mexican Students. *International Electronic Journal of Environmental Education, 11*(1), 42-57. doi:10.18497/iejeegreen.781808.

Donmez-Turan, A., & Kiliclar, I. E. (2021). The analysis of pro-environmental behaviour based on ecological worldviews, environmental training/ knowledge and goal frames. *Journal of Cleaner Production, 279*, 123518. doi:https://doi.org/10.1016/j.jclepro.2020.123518.

Du, J., & Pan, W. (2021). Evaluating energy saving behavioral interventions through the lens of social practice theory: A case study in Hong Kong. *Energy and Buildings, 251*, 111353. doi:https://doi.org/10.1016/j.enbuild.2021.111353.

Elisha, O. D., & Felix, M. J. (2020). The loss of biodiversity and ecosystems: a threat to the functioning of our planet, economy and human society. *International Journal of Economics, Environmental DevelopmentSociety, 1*(1), 30-44. https://d1wqtxts1xzle7.cloudfront.net/81910642/The_Loss_of_Biodiversity_and_Ecosyste.

Fogt Jacobsen, L., Pedersen, S., & Thøgersen, J. (2022). Drivers of and barriers to consumers' plastic packaging waste avoidance and recycling – A systematic literature review. *Waste Management, 141*, 63-78. doi:https://doi.org/10.1016/j.wasman.2022.01.021.

Gustina, N. (2024). Integration of character education in citizenship education learning to develop the character of elementary school students. *International Journal of Students Education*, 390-397. https://journal.berpusi.co.id/index.php/IJoSE/article/view/815.

Hakam, K. A., & Nurdin, E. S. (2020). *Metode-Metode Internalisasi Nilai(Value Internalization Methods)*. Bandung: Maulana Media Grafika.

Hartig, T. (2020). Special project on climate change: Issue introduction. *Applied Psychology Around the World, 2*(3), 6-9. https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1511916&dswid=268.

Hilbig, B. E., Zettler, I., Moshagen, M., & Heydasch, T. J. E. J. o. P. (2013). Tracing the path from personality—via cooperativeness—to conservation. *27*(4), 319-327. doi:https://doi.org/10.1002/per.1856.

Hutcheson, W., Hoagland, P., & Jin, D. (2018). Valuing environmental education as a cultural ecosystem service at Hudson River Park. *Ecosystem Services, 31*, 387-394. doi:https://doi.org/10.1016/j.ecoser.2018.03.005.

Jadhao, P. R., Ahmad, E., Pant, K. K., & D. P. Nigam, K. (2022). Advancements in the field of electronic waste Recycling: Critical assessment of chemical route for generation of energy and valuable products coupled with metal recovery. *Separation and Purification Technology, 289*, 120773. doi:https://doi.org/10.1016/j.seppur.2022.120773.

Janmaimool, P. (2016). *Evaluating determinants of rural Villagers' engagement in conservation and waste management behaviors based on integrated conceptual framework of Pro-environmental behavior. Life sciences, society and policy*, *12*, 1-20. (Vol. 12). https://link.springer.com/article/10.1186/s40504-016-0045-3.

Jeschonowski-Papstein, J., Gast, L., Binding, M., & Faulstich, M. (2024). Improving the recycling of plastic parts in household appliances–a review. *Resources, Conservation & Recycling Advances, 24*, 200235. doi:https://doi.org/10.1016/j.rcradv.2024.200235.

Julia, J., Supriyadi, T., & Iswara, P. D. (2022). Development of the Religious Character of the Nation through Learning Religious Songs: Teachers' Perception and Challenges. *Harmonia: Journal of Arts ResearchEducation, 22*(1), 103-118. doi:https://doi.org/10.15294/harmonia.v22i1.35031.

Kaiser, F. G., Oerke, B., & Bogner, F. X. (2007). Behavior-based Environmental Attitude: Development of An Instrument for Adolescents. *Journal of Environmental Psychology, 27*(3), 242-251.doi: https://doi.org/10.1016/j.jenvp.2007.06.004.

Kakoty, S. (2018). Ecology, sustainability and traditional wisdom. *Journal of Cleaner Production, 172*, 3215-3224. doi:https://doi.org/10.1016/j.jclepro.2017.11.036.

Kartika, A. D., Asnur, M. N. A., & Sumoukil, P. (2021). The Integration of Character Education and Intercultural Competence in German Learning Process. *Proceedings of the International Joint Conference on Arts and Humanities 2021 (IJCAH 2021)*, 884-889. doi:https://doi.org/10.2991/assehr.k.211223.152.

Keraf, S. (2010). *Etika Lingkungan Hidup*. Jakarta: PT. Kompas Media Nusantara.

Klein, S. A., Hilbig, B. E., & Heck, D. W. J. J. o. E. P. (2017). Which is the greater good? A social dilemma paradigm disentangling environmentalism and cooperation. *53*, 40-49. doi:https://doi.org/10.1016/j.jenvp.2017.06.001.

Kristjánsson, K. (2013). Ten Myths About Character, Virtue and Virtue Education – Plus Three Well-Founded Misgivings. *British Journal of Educational Studies, 61*(3), 269-287. doi:10.1080/00071005.2013.778386.

Lickona, T. (1991). *Educating for Character: How Our Schools Can Teach Respect and Responsibility*. New York: Bantam.

Liu, J., & Green, R. J. (2024). Children's pro-environmental behaviour: A systematic review of the literature. *Resources, Conservation and Recycling, 205*, 107524. doi:https://doi.org/10.1016/j.resconrec.2024.107524.

Long, R., Wang, J., Chen, H., Li, Q., Wu, M., & Tan-Soo, J.-S. (2023). Applying multilevel structural equation modeling to energy-saving behavior: The interaction of individual- and city-level factors. *Energy Policy, 174*, 113423. doi:https://doi.org/10.1016/j.enpol.2023.113423.

Maurer, M., & Bogner, F. X. (2020). Modelling environmental literacy with environmental knowledge, values and (reported) behaviour. *Studies in Educational Evaluation, 65*, 100863. doi:https://doi.org/10.1016/j.stueduc.2020.100863.

Mohd Suki, N., Majeed, A., & Mohd Suki, N. (2022). Impact of consumption values on consumers' purchase of organic food and green environmental concerns. *Social Responsibility Journal, 18*(6), 1128-1141. doi:10.1108/SRJ-01-2021-0026.

Muhammad, A., Suhaimi, S., Zulfikar, T., Sulaiman, S., & Masrizal, M. ( 2021). Integration of Local Culture-Based Educational Character through Online Learning in Madras Ahaliyah. *Jurnal Ilmu Pendidikan Siprus Bahasa Indonesia, 16 (6)* 3293-3304.

Murwaningsih, T., Fadhilah, S., & Sholeh, A. (2020). Implementation of Character Values Through Sadranan Local Wisdom in Elementary Schools. *International Journal of Multicultural and Multireligious Understanding, 7 (1)*, 450-458. doi:http://dx.doi.org/10.18415/ijmmu.v7i1.1315.

Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5-degree world: challenges and opportunities. *Global Sustainability, 4*, e22. doi:10.1017/sus.2021.23.

Phun, Y., Chauca, M., Curro, O., Chauca, C., Yallico, R., & Quispe, V. (2020). Disruptive education based on action characterizing eco-environmental variables to mitigate global warming. *Procedia Computer Science, 172*, 979-984. doi:https://doi.org/10.1016/j.procs.2020.05.142.

Poškus, M. S. J. S. (2020). What works for whom? Investigating adolescents' pro-environmental behaviors. *Sustainability. 12*(18), 7313.doi: https://doi.org/10.3390/su12187313.

Report, G. C. (2019). *Summary from Global Carbon Report 2019 and other press releases by GCP*. Retrieved from Global Carbon Project: https://www.globalcarbonproject.org/carbonbudget/archive/2019/Japan_NIES_GCB2019.pdf.

Ruziyeva, S. (2024). Enhancing environmental protection: Innovative strategies and solutions for addressing urgent ecological challenges. *E3S Web of Conferences, 587*, 02017. doi:https://doi.org/10.1051/e3sconf/202458702017.

Sauri, S. (2018). *Character Education in An Islamic Perspective*. Bandung: Rizqi Press.

Shivanna, K. R. (2022). Climate change and its impact on biodiversity and human welfare. *Proceedings of the Indian National Science Academy, 88*(2), 160-171. doi:10.1007/s43538-022-00073-6.

Singha, B., Karmaker, S. C., & Eljamal, O. (2023). Quantifying the direct and indirect effect of socio-psychological and behavioral factors on residential water conservation behavior and consumption in Japan. *Resources, Conservation and Recycling, 190*, 106816. doi:https://doi.org/10.1016/j.resconrec.2022.106816.

Soutter, A. R. B., & Mõttus, R. (2020). "Global warming" versus "climate change": A replication on the association between political self-identification, question wording, and environmental beliefs. *Journal of Environmental Psychology, 69*, 101413. doi:https://doi.org/10.1016/j.jenvp.2020.101413.

Sundin, N., Malefors, C., Strotmann, C., Orth, D., Kaltenbrunner, K., Obersteiner, G., . . . Eriksson, M. (2024). Sustainability assessment of educational approaches as food waste

prevention measures in school catering. *Journal of Cleaner Production, 481*, 144196. doi:https://doi.org/10.1016/j.jclepro.2024.144196.

Tamara, K. (2021). The Role of NGO in Overcoming the Environmental and Food Crisis in Indonesia During the COVID-19 Pandemic. *Frequency of International Relations, 3*(1), 82-103. doi:https://doi.org/10.25077/fetrian.3.1.82-103.2021.

UNESCO. (2016). UNESCO Official Website. Retrieved from http://www.unesco.org/new/es/our-priorities/sustainable-development/.

White, B. (2015). Scapegoat: John Dewey and the character education crisis. *Journal of Moral Education, 44*(2), 127-144. doi:10.1080/03057240.2015.1028911.

Williams, D. D., Yanchar, S. C., Jensen, L. C., & Lewis, C. J. J. o. M. E. (2003). Character education in a public high school: A multi-year inquiry into unified studies. *32*(1), 3-33. doi:http://dx.doi.org/10.1080/0305724022000073310.

Yu, M., Yang, C., & Li, Y. (2018). Big data in natural disaster management: a review. *Geosciences, 8*(5), 165. doi: https://doi.org/10.3390/geosciences8050165.