



Analysis of Students' Level of Environmental Literacy on Waste Management as An Effort for Green Behavior in East Jakarta Islamic Boarding School

AUTHORS INFO

Arum Sanjayanti
Universitas Indraprasta PGRI
arumsanja08@gmail.com
+6282129212369

Ferry Fauzi
Universitas Indraprasta PGRI
ferryfauzijkt@gmail.com
+6281281689190

ARTICLE INFO

E-ISSN: 2721-0804
P-ISSN: 2723-6838
Vol. 6, No. 1, Desember 2024
URL: <http://usnsj.com/index.php/biology>

Suggestion for the Citation and Bibliography

Citation in Text:

Sanjayati & Fauzi (2024)

Bibliography:

Sanjayati, A. & Fauzi, F. (2024). Analysis of Students' Level of Environmental Literacy on Waste Management as An Effort for Green Behavior in East Jakarta Islamic Boarding School. *Journal of Biological Science and Education*, 6(2), 77-83

Abstract

The abundance of waste is a serious problem in Indonesia, especially in Islamic boarding school environments. Waste management in general has been carried out. Still, it has not been actively promoted, and there is a lack of knowledge about minimizing the negative impact of waste in the Islamic boarding school environment even though they have previously received counseling about environmental literacy. This research aims to analyze the level of ecological literacy in waste management. The research method uses a qualitative descriptive method. The test instrument uses essay questions, and the non-test uses observations and interviews with teachers and school principals. The population of this study was all class X enrolled at one of the Islamic boarding schools. The sample was determined using a purposive sampling technique. The research sample consisted of 30 students in the even semester of 2023/2024. The research results show that waste management environmental literacy skills are in the "medium" category with a score of 143. These results show that among attitudes, behavior, knowledge, and cognitive skills. Knowledge is usually what students understand more quickly. This learning process can simultaneously help improve positive environmental behavior and students' emotional intelligence.

Keywords: Environmental literacy, Waste management, Green behavior

A. Introduction

Environmental literacy is an effort to become scientifically aware of the environment, which includes various knowledge about the environment. Environmental literacy is how to behave, be responsible, care for, and be mindful of the existence of the environment (Nasution, 2021). Environmental literacy is also an important aspect of education, especially for students, because it plays an important role in forming attitudes and behaviors that care about the environment for future generations. Environmental literacy is not limited to aspects of knowledge but also includes students' attitudes and behavior (Irawati et al., 2024). Environmental literacy at the East Jakarta Islamic Boarding School has not been maximally actively driven, even though previously they had received counseling about literacy regarding the separation of organic and inorganic waste, cultivating maggots from leftover food waste, and socializing about reforestation; however, after the environmental literacy activities were not running optimally. Based on the survey results, the problems that are still frequently found are the high volume of waste produced by waste from school competition activities (class meetings), the volume of food waste, snack packaging waste, drink bottles, and inorganic waste such as plastic bottles (Sanjayanti & Fauzi, 2024). It is known that the importance of students' environmental literacy in waste management for students in Islamic boarding schools includes; (a) forming good habits in maintaining cleanliness and minimizing the negative impact of waste in the Islamic boarding school environment, (b) implementing Islamic teachings and cleanliness is part of the faith, (c) equipping students with practical 3R recycling skills (Reuse, Reduce and Recycle), (d) fostering a sense of responsibility for waste management, integrating environmental literacy into the Islamic boarding school curriculum, will prepare students to become agents of sustainable change (Anabarja & Mubah, 2021; Debrah et al., 2021; Altassan, 2023; Farhany et al., 2023; Albar et al., 2024; Raziq et al., 2024). Environmental literacy is very important to equip students to develop issues and concern for the environment, develop practical skills in managing natural resources, and foster a sense of empathy and environmental responsibility towards future generations of the earth.

The concept of environmental literacy is emphasized by the Environment Education and Training Partnership (EETAP), which explains that an environmentally literate person will understand how to act and protect the environment. Students' environmental literacy status can be measured based on the criteria of environmental literacy components, namely: knowledge, cognitive skills, attitudes, and environmentally responsible behavior (NAAEE, 2011). Environmental education in schools aims to increase responsible behavior towards the environment so that students and all residents in schools can have environmental literacy (UNESCO, 2013). Furthermore, the importance of environmental literacy has been included in the P21 framework, and sustainable development, or Education for Sustainable Development (ESD), can instill awareness and form individuals who love the environment. Apart from that, having environmental literacy has great potential to change thought patterns and intelligence in solving existing environmental problems (Indriyani et al., 2020). Successful waste management among students will foster awareness and literacy towards environmental problems starting from a loving attitude and zero-waste lifestyle in the Islamic boarding school environment. These results are in line with research by Khorakian et al. (2024) that there is a close relationship between waste management and emotional intelligence, namely that good waste management not only requires practical knowledge and skills but also the ability to manage feelings, empathy, and self- and social awareness. Furthermore, emotional intelligence helps students to understand environmental impacts, motivate themselves to change bad habits and inspire others to participate in better waste management efforts and discipline. Thus, emotional intelligence can strengthen environmentally friendly behavior, create awareness, and manage stress in dealing with environmental problems.

The Minhajurrosyidin Islamic Boarding School is a boarding school in East Jakarta that has tried to use waste in maggot fertilizer, but its management is not optimal. Providing environmental literacy knowledge about waste is an important focus in changing the achievement of Islamic boarding schools towards green behavior. Seeing the problems in the field, the writing team was moved to conduct a research activity analyzing students' environmental literacy levels regarding waste management as a green behavior effort at the East Jakarta Islamic Boarding School. The novelty of the research analysis of students' ecological literacy levels regarding waste management as a green behavior effort in Islamic boarding schools includes (a) the level of students' knowledge about waste management in the Islamic boarding school environment and the negative impacts arising from each type of waste, (b) researchers implement an environmentally friendly lifestyle by reducing the use of paper by switching to digital in the teaching process and using environmentally friendly transportation when traveling, (c) reducing wastage/disposal of food in Islamic boarding schools, (d) encouraging responsible consumer behavior and discipline in reducing plastic use. Thus, it is hoped that this analysis can answer Islamic boarding school

environmental problems and create a future generation that cares about the environment.

B. Literature Review

Environmental literacy is the ability to understand, know, and apply knowledge about the environment and the issues involved in everyday life, especially in the focus of waste management. Good and sustainable waste management is an important part of efforts to create a healthy and friendly environment. Public understanding of environmental issues can shape green behavior, namely a lifestyle that supports ecological sustainability (Fang et al., 2022). Some of the roles of ecological literacy in waste management include: (a) ecological literacy equips students with knowledge about the types of waste (organic, inorganic, and dangerous), as well as the negative impacts of careless waste disposal on the environment, such as soil, water, and pollution. This encourages the community and students to be wiser in managing the waste produced; (b) environmental literacy encourages people to apply the 3R principle (Reduce, Reuse, Recycle); (c) ecological literacy equips students to differentiate between organic and inorganic waste so that they are more skilled in sorting the waste produced (Kamil et al., 2020).

Some positive lifestyle patterns include (a) increasing public awareness of the importance of good waste management. For example, through educational campaigns about the dangers of plastic waste and its impact on marine life; (b) environmentally friendly people's habits in sorting waste, reducing consumption of single-use products, and using more environmentally friendly goods. (c) Government policies and educational institutions form environmental literacy through education and training programs on the correct procedures for managing waste and the importance of preserving the environment (Khan et al., 2020; Khanum et al., 2023).

C. Methodology

1. Research Design

The research method uses a qualitative descriptive method. Qualitative methods are used to photograph and provide a real picture of the conditions that occur in the field. The population of this study was all class X registered at one of the Minhaajurrosyidiin Islamic Boarding Schools. The sample was determined using a purposive sampling technique so that one class consisted of 30 students.

2. Instruments

Data collection uses instruments consisting of tests and non-tests. The test instrument uses essay questions and the non-test uses observations and interviews with teachers and school principals. Class observations were carried out to obtain comprehensive data about the process of learning. The observations made are related to data collection for measuring students' environmental literacy. This is important because observing learning has supported literacy development student environment. The research data is in the form of environmental literacy scores obtained through a test instrument sheet consisting of 20 essay questions. The instrument used was adapted and modified from the Middle Schools Environment Instrument (MSELS/I) test questions and transformed into a NELA score (Marcinkowski et al., 2008). The transformation of environmental literacy test scores and score criteria can be seen in Table 1 and Table 2.

Table 1. Instrument Scoring Grid for Environmental Literacy Questions

No.	Environmental indicators	literacy	Activity aspects	Test form	Number of tests
1	Knowledge		Waste management	Essay	5
			Green behaviour	Essay	
2	Cognitive skills		Identify environmental issues	Essay	5
3	Attitude		Knowledge about the environment	Essay	5
			Sensitivity to the environment	Essay	
4	Behavior		Responsible for the environment	Essay	5

Table 2. Environmental Literacy Score Range

No	Aspect	Category			
		Range	Low	Medium	High
1	Knowledge	0-60	0-20	21-40	41-60
2	Cognitive skills	0-60	0-20	21-40	41-60
3	Attitude	15-60	15-30	31-45	46-60
4	Behaviour	12-60	12-27	28-44	45-60
5	Literacy score	27-240	27-98	99-169	170-240

3. Data Analysis Techniques

Data analysis in this study used descriptive. The data collected is analyzed and interpreted, then described to describe the conditions that occur in the research subjects. Assessment of student answers is matched based on environmental literacy scoring. Meanwhile, to process data using the formula $NP=R/SM \times 100\%$.

D. Findings and Discussion

1. Findings

Based on the results of research that has been carried out, the results of environmental literacy in waste management test data are presented in the form of inferential statistical data. The questions and analysis of the answers cover the four domains of environmental literacy. In general, the results of students' environmental literacy in waste management skills at the Minhaajurrosyidiin Islamic Boarding School, one of the Islamic boarding schools in East Jakarta, are presented in Figure 1.

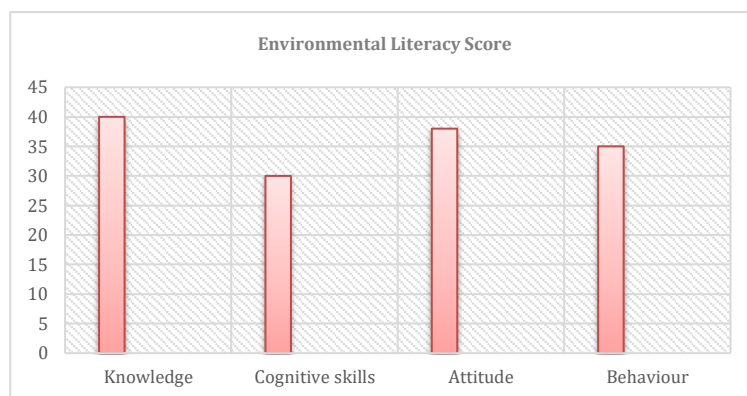


Figure1. Environmental literacy test scores

The picture above shows that the environmental literacy in waste management skills of students at Islamic boarding schools is in the "medium" category with a total score of 143 points. These points are obtained from combining each literacy domain score, including knowledge 40 points; cognitive skills 30 points; attitude 38 points; and behaviour 35 points. These results show that, among attitudes, behavior, knowledge, and cognitive skills, knowledge is usually what students understand more quickly in environmental literacy. This is because knowledge is more theoretical and can be taught through various methods, such as lectures, reading material, or discussions in class so that students quickly remember and understand basic information about the environment such as waste management, identification of environmental issues, sensitivity and literacy, responsibility for the environment. However, to change students' attitudes, behavior, or cognitive skills in terms of environmental literacy, more time and awareness of loving the environment is needed relevant to student's emotional intelligence, including; (a) attitudes are formed if students have a deep understanding and personal experience, (b) behavior is formed if students are accustomed to and practice real actions in protecting the environment, (c) cognitive skills are formed if students are sensitive to environmental issues to the point of being able to analyze and solve environmental problems sustainably, (d) increasing self-awareness, empathy, emotional management, social skills, self-motivation, and concern for the environment, students will be more connected to environmental issues and more motivated to contribute to keeping the environment around them clean.

2. Discussion

Based on the results of the analysis, students' environmental literacy in waste management as a green behavior effort is in the medium category. These results are relevant to students' ability to easily understand information about the environment such as waste management, identification of environmental problems, and sensitivity. and literacy, and responsibility for the environment. However, if the focus is on changing students' attitudes, behavior, or cognitive skills towards environmental literacy, then it takes time, awareness to love the environment, and balanced emotional intelligence. It also provides students with insightful knowledge and problem-solving abilities in solving environmental problems. (Purnami, 2020; Nasution, 2021; Sanjayanti & Fauzi, 2024). In-depth knowledge of environmental problems indeed has a very important role in forming attitudes and behaviors that care about the environment. When students have a better understanding of environmental issues and waste management, they will be more aware of the impact of human actions on nature and the importance of maintaining environmental sustainability. (Handayani et al., 2024; Puteri & Yuristin, 2025; Rezeki et al., 2024). Awareness of the direct learning experiences that students receive from the environment simultaneously can also help improve students' environmental behavior and emotional intelligence (Arti et al., 2024; Fitriani et al., 2025; Ishaq et al., 2025). On the other hand, if there is a lack of waste management literacy in the Islamic boarding school environment, it will have impacts including; environmental pollution in Islamic boarding schools, decreasing health quality, negative stigma of Islamic boarding schools, reducing the formation of the character of loving the environment in students, and will inhibit innovation and creativity thinking patterns. (Febria et al., 2024; Sofiyatun, 2024). During the learning process, students develop knowledge, cognitive skills, attitudes, and environmentally conscious behavior that enable them to respond to scientific problems designed to help find solutions. Because it is related to interest, motivation, and comfort in learning, environmental issues will be directly related to students' emotional components and will train students to be emotionally intelligent. The results of the latest research conducted by Junianto et al., (2025) state that environmental education must develop an understanding of ecological systems, cause and effect relationships between human attitudes and behavior towards the environment, as well as fostering environmentally responsible behavior in order to develop students' environmental literacy..

Good waste management is produced through a learning process, not by itself. One of the requirements for good waste management includes (a) an understanding of types of waste and their impacts, (b) awareness of the importance of waste recycling, (c) application of the 3R principle (Reduce, Reuse, Recycle), (d) management of organic waste and compost, (e) critical thinking and problem-solving skills related to waste management. Furthermore, waste management knowledge and talent alone are not enough; they must be accompanied by a sense of self-will, responsibility, locus of control, and sensitivity to the environment (Boyoh et al., 2024; Munif & Mauludin, 2024). Students' concern for the environment is not only an obligation for themselves but also for the Islamic boarding school environment where they study. Students who know the environment develop positive attitudes towards the environment and care more about the surrounding environment (Aini et al., 2020; Anggraini & Nazip, 2022). This helps in developing students' cognitive skills, which is one of the domains of environmental literacy. This finding is reinforced by previous research findings which state that environmental awareness and emotional intelligence in waste management in the learning process as well as students' academic behavior in the environment have an impact on increasing critical thinking skills, solutions, and literacy towards current environmental issues (Handayani et al., 2024; Anjani et al., 2025;). The implications of this research are changes in students behavior and attitudes towards the environment, the development of school policies, and their impact on the health and cleanliness of the school environment. This research is not only useful for creating a cleaner and healthier environment in school but also makes an important contribution to environmental education and the formation of students' characters who care about the sustainability of the earth. Furthermore, providing continuous education about environmental literacy regarding waste management will have an impact on reducing the amount of waste that has no economic value, increasing ecological literacy through ecological awareness, scientific attitudes, and intelligence in solving environmental problems to equip students to continue to care about the environment as a form of sustainable ecological development sustainable development goals (SDGs).

E. Conclusion

The results of the research show that the environmental literacy skills of waste management among students at Islamic boarding schools as a whole are in the medium category with a score of 143. These results show that, between attitudes, behavior, knowledge, and cognitive skills, knowledge is usually what students understand more quickly. In waste management environmental literacy. Learning process that introduces students to learning directly with the environment or learning outside the classroom, observing environmental problems and behavior that can have a positive impact on the environment. The direct learning experiences that students receive from the environment can simultaneously help improve students' environmental behavior and emotional intelligence. Increasing emotional intelligence, stimulating empathy, social skills, and self-awareness to care for the environment so that students are more motivated to contribute to keeping the environment clean.

Acknowledgment

I would like to express my deepest gratitude to Indraprasta University PGRI which provided research grant assistance (DIPA UNINDRA) and fully supported this research activity.

F. References

- Aini, N., Al Muhdhar, M. H. I., Rochman, F., Sumberartha, I. W., Wardhani, W., & Mardiyanti, L. (2020). Analysis of students' environmental literacy levels on local environmental education content. *Journal of Biology Education, State University of Malang*, 12(1), 40-44.
- Albar, M. K., Hamami, T., & Sukiman, S. (2024). Ecological Pesantren as an Innovation in Islamic Religious Education Curriculum: Is It Feasible?. *Edukasia Islamika*, 9(1), 17-40.
- Altassan, A. (2023). Sustainable integration of solar energy, behavior change, and recycling practices in educational institutions: a holistic framework for environmental conservation and quality education. *Sustainability*, 15(20), 15157.
- Anabarja, S., & Mubah, A. S. (2021). The Islamic Environmentalism in Eco-Pesantren Initiatives: Integrating the Sustainable Development Values in Islamic Boarding School. *Journal of International Studies on Energy Affairs*, 2(1), 75-90.
- Anggraini, N., & Nazip, K. (2022). Environmental Literacy Ability of Biology Education Students Using the Nela Score. *Journal of Education Action Research*, 6(4), 552-557.
- Anjani, A. D., Fatmawati, M. I., Batrisyia, Z. M. A., Permatasari, O., Marginingsih, S., & Muhtarom, T. (2025). Building Students' Character of Curiosity and Care for the Environment Through Research-Based Learning at the PKBM Salam Nature School. *Indo-MathEdu Intellectuals Journal*, 6(1), 409-416.
- Arti, E. D. S., Herniwanti, H., & Rahayu, E. P. (2024). Factors Relating To Community Behavior In Managing Household Waste Using The 3r Method In The Working Area Of The Tambusai Puskesmas. *Prepotif: Journal Of Public Health*, 8(1), 786-798.
- Boyoh, J. V. M., Ngangi, J., & Sumakul, J. L. (2024). Development of a Project Module for Strengthening the Profile of Pancasila Students through Sustainable Waste Management to Support the Implementation of the Merdeka Curriculum in Class XI of SMA Negeri 3 Tondano. *JSPB BIOEDUSAINS*, 5(1), 85-98.
- Debrah, J. K., Vidal, D. G., & Dinis, M. A. P. (2021). Raising awareness on solid waste management through formal education for sustainability: A developing countries evidence review. *Recycling*, 6(1), 6.
- Fang, W. T., Hassan, A. A., & LePage, B. A. (2022). Environmental literacy. In *The Living*
- Farhany, F. F., Amalia, I., Rachmawati, M. B., Ernia, W., Rinonce, H. T., Kusumawati, H. I., & Muslichah, R. (2023). An overview of clean and healthy living behavior practices in the Islamic boarding school (pondok pesantren) environment. *Journal of Community Empowerment for Health*, 6(2), 87-92.
- Febria, D., Irfan, A., Syafriani, S., Angraini, D. N., & Hardianti, S. (2024). Efforts to Improve Sanitation and Environmental Cleanliness at the Darun Nahda Bangkinang Islamic Boarding School. *Jurnal Medika: Medika*, 3(2), 57-61.
- Fitriani, W., Permana, G. D., Al Qadiri, W. M., & Supratikta, H. (2025). Collaboration of Human Resources, Technology and Environmental Awareness: Economic Development Strategy in the Era of the 5th Industrial Revolution 5.0. *Multidisciplinary Indonesian Center Journal (MICJO)*, 2(1), 26-35.
- Handayani, R., Noor, I. G., & Dewi, R. S. (2024). The Role of Environmentally Caring Character Education in Schools in Forming an Intelligent and Responsible Generation for Natural Conservation. *Ainara Journal (Jurnal Penelitian dan PKM Bidang Ilmu Pendidikan)*, 5(3), 372-

377.

- Indriyani, S., Afandi, A., & Wahyuni, E. S. (2020). Environmental Literacy and Environmental Awareness: Potential and Challenges in 21st Century Education. In Proceedings of the National Education Seminar "Freedom of Learning in Educational Institutions: Implementation and Relevance in Century Skills (Vol. 21, pp. 239-245).
- Irawati, H., Aprilia, N., & Saifuddin, M. F. (2024). Environmental Literacy of Teaching Students. *Biology Didactics: Journal of Biology Education Research*, 7(2), 91-97.
- Ishaq, M., Mubassir, A., Arifin, M. Z., Saiful, M., & Prasetya, B. (2025). Building Community Awareness in the Urban Transition Village Environment: Participatory Action Research Approach. *NAAFI: Student Scientific Journal*, 2(1), 71-79.
- Junianto, A., Syamsuddin, R. S., & Setiawan, A. I. (2025). Environmental empowerment through eco-Islamic boarding schools. *Tamkin: Journal of Islamic Community Development*, 10(1).
- Kamil, P. A., Putri, E., Ridha, S., Utaya, S., & Utomo, D. H. (2020, May). Promoting environmental literacy through a green project: a case study at adiwiyata school in Banda Aceh City. In *IOP Conference Series: Earth and Environmental Science* (Vol. 485, No. 1, p. 012035). IOP Publishing
- Khan, M. S., Saengon, P., Alganad, A. M. N., Chongcharoen, D., & Farrukh, M. (2020). Consumer green behaviour: An approach towards environmental sustainability. *Sustainable Development*, 28(5), 1168-1180.
- Khanum, B., Haleem, B., & Zaman, F. U. (2023). Exploring the Role of Green Education in Enhancing Multiple Literacies for the 21st Century: Preparing Students for Globalized Living and Working in the New Millennium. *Pakistan Social Sciences Review*, 7(3), 1083-1098.
- Khorakian, A., Baregheh, A., Jahangir, M., Heidari, A., & Saadatyar, F. S. (2024). Household food waste prevention behavior: the role of religious orientations, emotional intelligence, and spiritual well-being. *Journal of Environmental Planning and Management*, 67(1), 59-84.
- Marcinkowski, T., Potter, G., & Day, B. (2008). National Environmental Literacy Assessment Project: Year 1, National Baseline Study of Middle Grades Students Final Research Report.
- Munif, A., & Mauludin, M. S. (2024). Assistance in Waste Management in Increasing Zero Waste and Economic Value at the Darussalam II Kencong Islamic Boarding School, Kepung, Kediri. *Journal of Village Community Service (JPMD)*, 5(3), 457-475.
- NAAEE by the North American Association for Environmental Education (2011). Washington, USA <http://www.naaee.net/>.
- Nasution, R. (2021). Analysis of the environmental literacy level of FKIP students at Mulawarman University using NELA (National Environmental Literacy Assessment) score transformation. *BioSmart Scientific Journal (JIBS)*, 7(1), 38-51.
- Purnami, W. (2020). Waste management in the school environment to increase students' ecological awareness. *Inquiry: Journal of Science Education*, 9(2), 110-116.
- Puteri, A. D., & Yuristin, D. (2025). Education on the Introduction and Management of Organic Waste and Inorganic Waste at SDN 019 Lipat Kain Utara. *COVIT (Community Service of Tambusai)*, 5(1), 29-34.
- Raziq, M. A., Khan, N., & Maroof, M. M. (2024). Teachings and Instructions of Islam about Cleanliness and Hygiene in the Light of Quran and Hadiths. *Annals of Human and Social Sciences*, 5(3), 515-522.
- Rezeki, T. I., Sagala, R. W., & Muhajir, M. (2024). Local Wisdom-Based Waste Management Education for a Sustainable Environment. *Abdimas Maduma Journal*, 3(2), 9-19.
- Sanjayanti, A., & Fauzi, F. (2024). Ecobrick: Innovative Solution for Utilizing Inorganic Plastic Waste and Building Zero Waste Students' Living Habits in Jakarta. *Community Service Journal Warehouse*, 2(2), 111-115.
- Sofiyatun, S. (2024). *Santri Wati's Legal Efforts in Overcoming Garbage Pollution at the Annuqayah Guluk-Guluk Islamic Boarding School, Sumenep (Doctoral dissertation, Islamic University of Malang)*.
- UNESCO. (2013). Shaping the Education of Tomorrow: 2012 Report on the UN Decade of Education for Sustainable Development (Report). *Journal of Education for Sustainable Development*, 7(1), 135-136