

## CARING FOR THE EARTH AND HEALING STUDENTS THROUGH THE SYNERGY OF ISLAMIC ECOTHEOLOGY AND COUNSELING IN WASTE EDUCATION

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### ABSTRACT

*The issue of waste is a very pressing matter that requires serious attention because it has a direct impact on the environment, health, and the sustainability of human life. This study aims to increase the knowledge and attitudes of Islamic boarding school students. The objective of the study is to improve knowledge and attitudes to care for and heal Islamic boarding school students through the synergy of Islamic ecotheology and counseling in waste education. The type of research used in this study is quasi-experimental research with a one-group pretest-posttest design. This study involved 30 santri who were selected purposively based on recommendations from the pesantren. The statistical test used was the Paired Sample t-Test with the help of JASP version 16 computer software. The results of this study show that interventions in the form of counseling can significantly improve the knowledge and attitudes of santri regarding Islamic ecotheology and waste management in pesantren. The Wilcoxon test results showed a significant increase in knowledge ( $p < 0.001$ ), while the Paired Sample t-Test showed an increase in attitude from an average score of 26.60 on the pretest to 36.10 on the posttest with a p-value  $< 0.001$ . This confirms that counseling not only improves conceptual understanding but also encourages positive attitude changes that have the potential to continue in real behavior in maintaining the cleanliness and sustainability of the pesantren environment.*

**Keywords :** *Islamic Ecotheology, Peer Counseling, Waste, Training.*

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### Introduction

The issue of waste is an urgent problem that has a direct impact on the environment, health, and human sustainability (Saraswati, 2023). Population growth and consumption patterns have increased the volume of waste disproportionately to the management system, causing pollution, disease, and greenhouse gas emissions. The urgency of waste management is not only related to hygiene, but also economic and social aspects. Therefore, strategic measures are needed, ranging from reduction at source,

increasing awareness of sorting and recycling, to the development of environmentally friendly technologies (Prihatin, 2020).

According to the Global Waste Management Outlook 2024 report, global municipal waste production is expected to increase from 2.1 billion tons in 2023 to 3.8 billion tons in 2050. The direct cost of waste management in 2020 is estimated to reach USD 252 billion, but when considering hidden impacts such as pollution, health problems, and climate change due to poor waste disposal

practices, the total cost increases to USD 361 billion. Without immediate action on waste management, this global annual cost could nearly double to USD 640.3 billion by 2050 (UNEP, 2024).

Indonesia ranks fifth in the world as a waste producer and third as a contributor of plastic waste (Syarif, 2022). According to data from the National Waste Management Information System (SIPSN), Indonesia's waste generation in 2023 will reach 56.63 million tons. However, only 39.01% (22.09 million tons) is managed properly. The majority of the remainder is still disposed of in open dumps, which pollute the environment and do not meet modern management standards. Of the total 550 landfills in Indonesia, 343 units are being monitored to stop open dumping practices. Many of them have also exceeded their capacity, indicating a waste emergency that cannot be delayed any longer. (Indonesia, 2023). This situation is exacerbated by the fact that many landfills have exceeded their capacity. In North Sumatra, nearly 2 million tons of waste are generated each year (2019–2022), predominantly consisting of food waste (35%), plastic (13.9%), paper (13.71%), and wood and branches (15.5%) (Ayu, 2024).

Langkat Regency, North Sumatra, produces a significant amount of waste every year. In 2021, the amount of waste

recorded was around 189,686 tons, increasing to 190,367 tons in 2023. The composition of waste in this region is dominated by food waste at around 38 percent, followed by paper or cardboard at 14.9 percent, and plastic at around 14 percent, while the rest consists of wood, metal, fabric, and other materials in smaller quantities. Faced with these conditions, the Langkat Regency Government, through the Environment Agency, has developed various waste management innovations, including the use of Black Soldier Fly (BSF) larvae, which can decompose 100-150 kilograms of organic waste per day, the establishment of a community waste bank in Pasar Rawa Village, and the development of a Recycling Village in Bahorok District as a community-based management model.

The waste problem is mainly caused by low public awareness of proper waste sorting and disposal. The habit of littering without sorting triggers accumulation and pollution, which is exacerbated by a lack of discipline and understanding of the long-term impact on health and the environment. Islamic eco-theology plays an important role in fostering environmental awareness through teachings of cleanliness, balance, and responsibility as stewards of the earth, including wise waste management (Widiastuty & Anwar, 2025). In addition, peer counseling effectively encourages

positive behavior because the message is conveyed in a relevant, easily accepted manner, supported by the closeness of interpersonal experiences (Nasution, 2018).

The Uswatun Hasanah Islamic boarding school is located in Langkat Regency, North Sumatra. Initial observations indicate that the boarding school still faces waste management issues, characterized by scattered waste, minimal separation of organic and inorganic waste, and limited waste bins. This situation is exacerbated by the low level of knowledge and awareness among students, most of whom do not understand the importance of waste separation, resulting in the continued practice of littering.

Research by Sari, et. al (2024) found that factors related to waste management actions are knowledge, attitude, and availability of facilities (Nila Sari, Suhadi, 2025). Health education has an impact on improving the knowledge, attitude, and skills of the community so that they are able to change their behavior towards a healthier lifestyle. The results of research by Apriliani, et. al (2024) found through a literature study that health education led to a 60–70% increase in knowledge after counseling, and improved attitudes/behaviors when there was follow-up assistance (Apriliani et al., 2024).

Based on this background, the purpose of this study is to increase students' knowledge

and attitudes towards waste management through education in order to care for the earth and heal students through the synergy of Islamic ecotheology and counselling

## **Method**

This type of research is quasi-experimental research with a one-group pretest-posttest design. This design was chosen because it allows researchers to measure differences in subjects' conditions before and after intervention without using a control group. The research was conducted at the Uswatun Hasanah Islamic Boarding School, Langkat, from July to October 2025. This location was chosen based on considerations of the low awareness of students in waste management and their potential as agents of change through education based on Islamic ecotheology and peer counseling.

The research participants were 30 students selected using purposive sampling based on recommendations from the Islamic boarding school. The inclusion criteria for participants were students who were willing to participate in the entire series of activities, were actively involved in the activities of the Islamic boarding school, and had no communication barriers. The selection of the number of participants was also based on considerations of time constraints and the effectiveness of the intervention in the context of the Islamic boarding school.

The instrument used in this study was a closed questionnaire containing questions about the knowledge, attitudes, actions, and skills of santri in waste management. The instrument was developed based on environmental education indicators and Islamic eco-theological values, such as the concepts of khalifah fil ardh, amanah, and responsibility for environmental sustainability. Before use, the instrument was tested for validity and reliability to ensure the reliability of the data obtained.

The research procedure was carried out in several stages. First, a pretest was conducted to measure the knowledge, attitudes, actions, and skills of the students before the intervention. Second, an intervention was provided in the form of Islamic eco-theology counseling, peer counseling sessions, and hands-on practice in waste management, such as sorting organic and inorganic waste and simple management through the educational program “Trash to Treasure” (TOSS). This

intervention was carried out in the form of group discussions, role plays, and practical activities in the pesantren environment. Third, a posttest was conducted to measure changes after the intervention. The entire series of activities was carried out with the assistance of researchers and pesantren officials to ensure that it ran according to the research schedule and targets.

The data obtained was analyzed quantitatively. Descriptive analysis in the form of frequency distribution and percentages was used to describe the characteristics of the respondents and the results of the questionnaire answers. Next, a normality test was conducted using the Shapiro-Wilk Test to determine the data distribution. If the data was normally distributed, the difference between the pretest and posttest scores was analyzed using the Paired Sample t-Test using JASP software version 16. If the data was not normally distributed, the Wilcoxon Signed Rank Test was used as an alternative non-parametric analysis.

## Results

**Table 1 Characteristics of Respondents (n=30)**

Characteristics	n	%
<b>1. Gender</b>		
a. Woman	30	100
<b>2. Age</b>		
a. 13 Year	8	26,7
b. 14 Year	3	10,0
c. 15 Year	8	26,7
d. 16 Year	8	26,7
e. 17 Year	3	10,0

Characteristics	n	%
<b>3. Class</b>		
a. 2 Junior High School	5	16,7
b. 3 Junior High School	7	23,3
c. 1 High School	6	20,0
d. 2 High School	6	20,0
e. 3 High School	6	20,0
<b>Total</b>	<b>30</b>	<b>100</b>

According to Table 1, all respondents in this study were female (100%). In terms of age, the distribution of respondents consisted of 8 people (26.7%) aged 13 years, 3 people (10.0%) aged 14 years, 8 people (26.7%) aged 15 years, 8 people (26.7%) aged 16 years, and 3 people (10.0%) aged 17 years. Meanwhile, in terms of grade level, the respondents were spread across junior high school and high

school, namely 5 people (16.7%) in the 2nd grade of junior high school, 7 people (23.3%) in the third grade of junior high school, 6 people (20.0%) in the first grade of senior high school, 6 people (20.0%) in the second grade of senior high school, and 6 people (20.0%) in the third grade of senior high school. The total number of respondents was 30 people (100%).

**Table 2 Distribution of Knowledge and Attitudes of Islamic Boarding School Students Before and After Community Service**

Variable	Pre-test		Post-test	
	n	%	n	%
<b>Knowledge</b>				
Not Good	19	63,3	0	0,0
Good	11	36,7	30	100
<b>Attitude</b>				
Not Good	21	70,0	0	0,0
Good	9	30,0	30	100
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

According to Table 2, there was a significant change in the knowledge and attitudes of the students after the community service program. In the pre-test stage, most respondents were still in the poor knowledge category, namely 19 people (63.3%), while only 11 people (36.7%) were in the good knowledge

category. After the intervention, all respondents (100%) improved to the good knowledge category. A similar condition was also found in the attitude variable, where before the intervention, 21 people (70.0%) were still in the poor category and only 9 people (30.0%) had a good attitude.

After the intervention, all respondents (100%) showed a good attitude.

**Table 3 Data Normality Test Knowledge and Attitude**

Variable	Kolmogorov-Smirnov	Description	Shapiro-wilk	Description
<b>Knowledge</b>				
Pretest	0.061	Normal	0.093	Normal
Post-test	0.001	Abnormal	0.001	Abnormal
<b>Attitude</b>				
Pretest	0.200	Normal	0.464	Normal
Post-test	0.014	Abnormal	0.056	Normal

According to Table 3, the results of the normality test using Shapiro-Wilk on a sample of 30 respondents, the analysis of the difference in attitudes between the pre-test and post-test was conducted using a paired t-test, because the data were normally distributed in both the pre-test ( $p = 0.464$ ) and post-test ( $p = 0.056$ ). Meanwhile, for the knowledge variable, the

Wilcoxon Signed Rank Test was used, considering that the post-test results showed a non-normal distribution ( $p = 0.001$ ). The use of Shapiro–Wilk was preferred over Kolmogorov–Smirnov, because this method is considered more sensitive and suitable for small to medium sample sizes ( $n < 50$ ).

**Table 4 Descriptive Statistics of Knowledge and Attitude Values of Islamic Boarding School Students Before and After Community Service**

Variable	N	Mean	SD	Min	Maks
<b>Knowledge</b>					
Pre-test	30	10,77	2,46	6	15
Post-test	30	17,97	1,77	12	20
<b>Attitude</b>					
Pre-test	30	26,60	4,31	19	35
Post-test	30	36,10	2,92	35	43

According to Table 4, there was an increase in the mean value of the variables of knowledge and attitude of the students after the implementation of community service. In the knowledge variable, the pre-test mean value was 10.77 with a standard deviation of 2.46, a minimum value of 6,

and a maximum value of 15. After the intervention, the mean increased to 17.97 with a standard deviation of 1.77, a minimum value of 12, and a maximum value of 20. This shows that all santri experienced an increase in knowledge with a relatively more homogeneous distribution

of values in the post-test compared to the pre-test.

For the attitude variable, the pre-test mean score was 26.60 with a standard deviation of 4.31, a minimum score of 19, and a maximum score of 35. After the intervention, the average score increased to 36.10 with a standard deviation of 2.92, a

minimum score of 35, and a maximum score of 43. This increase shows that in addition to the average attitude score increasing, the variation in respondents' scores also decreased, indicating the formation of a more evenly distributed positive attitude among all students.

**Table 5 Results of the Wilcoxon Test of Santri Knowledge**

Variable	Z	p value
Post test–Pre test	-4,791	<0,001

According to Table 5, the Wilcoxon test results show a Z value of -4.791 with a p value < 0.001. This value is smaller than  $\alpha = 0.05$ , so it can be concluded that there is a significant difference between the

knowledge scores of the students in the pre-test and post-test. Thus, intervention through community service activities has been proven effective in significantly improving the knowledge of santri.

**Table 6 Results of Paired Sample t-Test on Santri Attitudes**

Variable	Mean Difference	SD	95% CI (Lower–Upper)	t	df	p value
Post test–Pre test	9,500	4,974	7,643-11,357	10,461	29	<0,001

According to Table 6, the results of the paired sample t-test show that there is a significant difference between the santri's attitudes before and after the intervention. The mean difference is 9.50 with a standard deviation of 4.974 and a 95% confidence interval (CI) between 7.643 and 11.357. The t-value obtained was 10.461 with 29 degrees of freedom (df) and a p-value < 0.001 ( $p < 0.05$ ). This indicates that the community service intervention had a significant effect on improving the attitudes

of the students.

## Discussion

### 1. Increasing Santri Knowledge about Islamic Ecotheology and Peer Counseling

Based on the results of the study, it was found that there was an increase in students' knowledge of Islamic eco-theology and peer counseling after being given an intervention in the form of community service activities in the form of counseling. Before the intervention, most students had

poor knowledge, as seen in the pretest, where 63.3% of respondents were in the poor category. However, after the counseling, all respondents (100%) were in the good knowledge category. This shows that the counseling was able to significantly improve the students' understanding.

When viewed from specific indicators, such as knowledge of the definition of Islamic eco-theology, verses from the Qur'an about khalifah on earth, the impact of environmental damage, the concept of eco-pesantren, and the three pillars of eco-prophetic education, there was a significant increase with a percentage increase ranging from 16.7% to 83.3%. The highest increase occurred in the indicator of the three pillars of eco-prophetic education, which initially none of the students knew about (0%) to 83.3% after the intervention.

Additionally, indicators related to peer counseling, such as the purpose of counseling, the role of counselors as agents of change, and understanding the GATHER stages, also showed significant increases. This indicates that the educational materials provided were relevant, easy to understand, and able to address all the knowledge indicators tested.

Statistical test results support these findings. The Wilcoxon test showed a significant increase in knowledge ( $p < 0.001$ ), while the Paired Sample t-Test showed a significant increase in attitude ( $p$

$< 0.001$ ). Thus, it can be concluded that intervention through counseling can increase knowledge and shape positive attitudes among students regarding Islamic ecotheology and waste management in Islamic boarding schools.

Research at Al Hikmah Islamic Boarding School in Bogor shows that counseling on waste management can improve students' understanding. Before counseling, most students had poor knowledge. After counseling, all respondents were in the good knowledge category. Statistical test results show a p-value  $< 0.001$ , which means there was a significant increase in students' knowledge (Hidayah et al., 2022).

Research at the Nurul Ulum Islamic Boarding School in Peureulak, East Aceh, aimed to determine the effect of health promotion through educational videos on students' knowledge and attitudes toward waste management. The results of the paired t-test showed a p-value of 0.000 ( $p < 0.05$ ) for knowledge, which means there was a significant effect on students' knowledge (Zikra & Lestari, 2024)

Research at the Daarul Furqon Palopo Al-Qur'an Tahfizh Boarding School shows that education and training in Takakura compost-based waste management can increase students' knowledge. The Wilcoxon test results show a p-value = 0.000 ( $p < 0.05$ ), which means

that this activity has a significant effect on increasing participants' knowledge (Forjati;Ridwan, 2024).

Research at Al-Amanah Modern Islamic Boarding School shows that ecological spiritual education should be an important part of the boarding school curriculum because it has an impact on students by combining Islamic religious education and environmental awareness (Hakim, 2025).

Research at Langitan Islamic Boarding School in Tuban shows that the process of internalizing eco-theology is carried out through the integration of the learning curriculum, general lectures, group discussions, as well as real actions in daily life and digital media at the boarding school (Rifa & Yusuf, 2025).

Thus, community service activities based on outreach not only provide information, but also shape the ecological awareness and social responsibility of santri, thereby potentially becoming a model for comprehensive pesantren-based environmental education.

## **2. Improvement of Santri Attitudes towards Waste Management in Islamic Boarding Schools**

The results of the study show an increase in santri attitudes towards waste management in Islamic boarding schools after an intervention in the form of education through community service

activities. Before the intervention, the majority of santri tended to be hesitant or negative towards various aspects of waste management, as reflected in the pretest results. For example, in terms of general attitudes towards waste management, most respondents were in the hesitant/neutral category (36.7%) or strongly disagreed (26.7%), while only 16.7% strongly agreed. This shows that the awareness and involvement of students in waste management was still low before receiving education.

After the intervention, there was a positive shift in attitudes on almost all indicators. In terms of the importance of sorting organic and inorganic waste, the number of respondents who agreed increased to 43.3%, and no respondents strongly disagreed. Similarly, in terms of the habit of disposing of waste according to type, the proportion of respondents who agreed and strongly agreed increased significantly from 20% to 53.7%, indicating that education was able to encourage potential behavioral change.

The intervention was also effective in increasing the active participation of students. For example, in terms of involvement in creative waste management activities, the pretest showed that the majority were reluctant or hesitant, but the posttest showed that all respondents had a positive attitude, with 43.3% agreeing and

56.7% strongly agreeing. This indicates that the counseling not only increased knowledge but also motivated students to take an active role in waste management at the Islamic boarding school.

In addition, santri's social attitudes toward environmental management have also improved. Indicators such as reminding friends who litter and bringing their own drinking bottles to reduce plastic use showed a significant increase in the "agree" category, although some respondents were still undecided. This shows a process of internalizing environmental values, where the knowledge gained is translated into intentions to act positively in daily social interactions.

Willingness to set an example in maintaining environmental cleanliness and efforts to reduce the use of single-use plastics also increased. The pretest showed that negative and hesitant attitudes dominated, while the posttest showed a significant increase in the agree and strongly agree categories. Similarly, the belief that sustainable waste management can make Islamic boarding schools more environmentally friendly has increased, indicating the formation of a more mature ecological awareness.

Statistical analysis supports these findings. The distribution of santri attitudes was normally distributed, allowing the use

of a Paired Sample t-Test. The test results showed an increase in the average score from 26.60 on the pretest to 36.10 on the posttest, with  $p < 0.001$ . This confirms that the counseling intervention was effective in improving santri attitudes toward waste management in Islamic boarding schools.

Overall, these findings indicate that outreach based on community service activities can shape students' ecological awareness and social responsibility, while encouraging positive behavioral change. These results are consistent with previous studies emphasizing that direct educational approaches such as outreach are effective in increasing environmental understanding and awareness. Thus, this outreach model has the potential to become an effective and sustainable environmental education strategy in Islamic boarding schools.

These findings are in line with research on Empowering Sanitation Da'wah in Islamic Boarding Schools at the Jagat Arsy Islamic Boarding School in South Tangerang, which shows that sanitation da'wah interventions significantly improve students' attitudes towards sanitation, with a p-value of 0.027. This confirms that education-based counseling can encourage positive attitude change in participants, as they are actively involved in activities relevant to their daily lives, thereby facilitating the internalization of values

related to cleanliness and waste management (Sumantri et al., 2024).

In addition, research on the Analysis of Factors Affecting Santri Behavior in Maintaining Cleanliness in Islamic Boarding Schools found that attitude factors have a significant influence on santri behavior in maintaining cleanliness ( $p = 0.03$ ). This finding supports the results of the current study, as an increase in students' attitudes after counseling was followed by a tendency for them to take concrete actions, such as disposing of trash in its proper place and reminding friends who litter. In other words, attitude change is the basis for the formation of sustainable positive behavior in the boarding school environment (Yulia Putri Fatmilarini et al., 2023).

Furthermore, the study Evaluation of Islamic Boarding School Health Post Cadres in Improving Clean and Healthy Living Behaviors also shows that the role of health post cadres is effective in improving students' attitudes towards clean and healthy living behaviors, with a p-value of 0.027. This reinforces the findings of this study, which show that interventions involving the active participation of students and a community-based approach can increase awareness and motivation to maintain environmental cleanliness consistently, not just in theory but also in practice (Safitri et al., 2021).

Research on Improving Santri Understanding through Counseling at Al Hikmah Islamic Boarding School shows an increase in santri understanding and awareness of waste management by 7.14% after counseling, although the p-value is not mentioned. This finding is consistent with the results of this study, because even though attitude change requires time and active involvement, counseling is still able to encourage a positive shift from an indecisive attitude to a more caring and proactive attitude towards waste management (Hidayah et al., 2022).

Overall, the findings of this study are consistent with previous studies that emphasize that counseling, direct education, and community-based interventions are effective in improving santri attitudes toward waste management. This improvement in attitude is an important first step in shaping positive behavior and sustainable ecological awareness in the pesantren environment.

### **Conclusions**

The results of this study show that counseling interventions can significantly improve students' knowledge and attitudes regarding Islamic eco-theology and waste management in Islamic boarding schools. The Wilcoxon test results show a significant increase in knowledge ( $p < 0.001$ ), while the Paired Sample t-Test shows an increase in attitudes from an

average score of 26.60 on the pretest to 36.10 on the posttest with a p value < 0.001. This confirms that counseling not only improves conceptual understanding but also encourages positive attitude changes that have the potential to continue in real behavior in maintaining the cleanliness and sustainability of the pesantren environment.

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