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Analysis of Environmental Literacy Level of Boarding School Students in Medan Tembung District

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ABSTRACT
This study aims to analyze the level of environmental literacy among university students living in boarding houses in Medan Tembung District and to examine the role of the boarding house environment in supporting pro-environmental behavior. This research employed a quantitative approach with a descriptive survey design involving 60 respondents selected using accidental sampling. Data were collected through a Likert-scale questionnaire measuring environmental knowledge, attitudes, and behaviors, and analyzed using descriptive statistics. The results indicate that the environmental literacy level of boarding house students is categorized as good across all measured dimensions. Environmental attitudes and support from the boarding house environment show the highest average scores, while pro-environmental behavior, although still categorized as good, appears relatively lower. These findings suggest that students' environmental behavior is influenced not only by individual factors but also by the availability of facilities and the management of the boarding house environment. This study concludes that the boarding house environment plays a crucial role in supporting the implementation of students' environmental literacy. Therefore, improving sanitation facilities and strengthening environmental management in boarding houses are recommended to promote sustainable pro-environmental behavior among students.

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ABSTRACT
Penelitian ini bertujuan untuk menganalisis tingkat literasi lingkungan mahasiswa penghuni kos di Kecamatan Medan Tembung serta mengkaji peran lingkungan kos dalam mendukung perilaku pro-lingkungan. Penelitian menggunakan pendekatan kuantitatif dengan desain survei terhadap 60 responden yang dipilih menggunakan teknik accidental sampling. Data dikumpulkan melalui kuesioner berbasis skala Likert yang mengukur dimensi pengetahuan, sikap, dan perilaku lingkungan, kemudian dianalisis menggunakan statistik deskriptif. Hasil penelitian menunjukkan bahwa tingkat literasi lingkungan mahasiswa berada pada kategori baik pada seluruh dimensi yang diukur. Dimensi sikap lingkungan dan dukungan lingkungan kos menunjukkan nilai rata-rata tertinggi, sedangkan dimensi perilaku pro-lingkungan berada pada kategori baik namun relatif lebih rendah. Temuan ini mengindikasikan bahwa perilaku ramah lingkungan mahasiswa tidak hanya dipengaruhi oleh faktor individu, tetapi juga oleh ketersediaan fasilitas dan pengelolaan lingkungan kos. Penelitian ini menyimpulkan bahwa lingkungan kos memiliki peran penting dalam mendukung penerapan literasi lingkungan mahasiswa. Oleh karena itu, disarankan adanya peningkatan fasilitas kebersihan serta pengelolaan lingkungan kos yang lebih terstruktur sebagai upaya mendorong perilaku pro-lingkungan mahasiswa secara berkelanjutan.

KATA KUNCI
literasi lingkungan; mahasiswa penghuni kos; perilaku pro-lingkungan; lingkungan kos

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Introduction

Environmental literacy is the ability of individuals to understand ecological concepts, assess environmental problems, and apply behaviors that support sustainability in daily life. This literacy includes the dimensions of knowledge, attitudes, and behaviors that are interrelated in forming concern and responsibility for the environment (Supriatna, 2021; Nugraha & Suryani,

2020). Students as an educated group and agents of change are expected to have a good level of environmental literacy, considering their strategic role in encouraging sustainability practices in society (Mahmudah & Purwanto, 2022).

Various previous studies have shown that the level of environmental literacy of students in Indonesia is in the medium to good category. However, a number of studies have also revealed a gap between environmental knowledge and the application of pro-environmental behaviors in daily life, particularly in waste management, reducing the use of single-use plastics, and saving energy (Hasanah & Ramadhani, 2021). These findings are in line with international studies that state that environmental awareness is not always directly proportional to environmentally friendly practices, especially when it is not supported by situational and structural factors (Kollmuss & Agyeman, 2002; Vicente-Molina et al., 2018).

Most student environmental literacy research has focused on formal contexts, such as the campus environment or educational institutions. In fact, students also spend most of their time in non-formal living spaces, such as boarding houses, which have different characteristics from the campus environment, both in terms of facility management, regulations, and daily habits. Life in boarding houses is often characterized by a practical lifestyle, high consumption, and a lack of control and supervision over environmental behavior, which has the potential to produce large volumes of waste and less efficient use of resources (Putri, 2022).

In dense urban areas such as Medan Tembung District, boarding houses are the main form of residence for students from various universities. The diversity of the socio-cultural backgrounds of boarding house residents also influences their lifestyle and environmental habits. Data from the Medan City Environmental Agency (2023) shows a significant increase in the volume of household waste, including from temporary residential areas such as boarding houses and rents. However, empirical studies that specifically examine student environmental literacy in the context of boarding houses in this region are still limited.

The research gap in this study lies in the lack of studies that integrate the analysis of student environmental literacy with the context of non-formal living spaces, especially boarding houses, as well as their relationship with facilities and residential environment management factors. Most of the previous studies are still descriptive and have not explicitly linked empirical findings to the implications of policies or sustainable student residential environmental management models. This study aims to: (1) analyze the level of environmental literacy of students living in boarding houses in Medan Tembung District, (2) identify factors that affect students' pro-environmental behavior, and (3) examine environmentally friendly practices in daily life in boarding houses.

Therefore, this research is important to provide an empirical picture of how student environmental literacy is manifested in daily practice in the boarding house. The findings of this research are expected not only to contribute to the development of environmental literacy studies in non-formal contexts, but also to become the basis for the formulation of policies and models for the management of student residential environments that are more effective and contextual, through collaboration between boarding house residents, managers, educational institutions, and local governments.

Method

This study employed a quantitative approach using a descriptive survey design to analyze the environmental literacy level of boarding house students in Medan Tembung District, Medan

City, North Sumatra, Indonesia. The survey design was selected because it enables researchers to systematically collect data regarding environmental knowledge, attitudes, and behaviors from a relatively large group of respondents within a specific context (Creswell & Creswell, 2018).

The study was conducted in November 2025 and involved 60 boarding house students residing in Medan Tembung District. Respondents were selected using accidental sampling, whereby participants who met the study criteria and were willing to participate during the data collection period were included in the sample. This technique was considered appropriate due to the absence of a comprehensive sampling frame of boarding house residents and the exploratory nature of the study.

Environmental literacy was conceptualized as a multidimensional construct consisting of three major dimensions: environmental knowledge, environmental attitudes, and pro-environmental behavior (Roth, 1992; Hollweg et al., 2011). Based on these dimensions, a structured questionnaire was developed to measure respondents' environmental literacy levels.

Table 1. Variabel Operational

Variable	Dimension	Indicator
Environmental Literacy	Environmental Knowledge	Understanding of waste management, pollution, resource conservation
Environmental Literacy	Environmental Attitude	Environmental concern, responsibility, awareness
Environmental Literacy	Environmental Behavior	Waste sorting, energy saving, water conservation, participation in environmental activities

Data were collected using a Google Form-based questionnaire consisting of closed-ended statements measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument included items related to environmental awareness, waste management practices, resource conservation, environmental responsibility, and environmentally friendly daily behaviors. Prior to distribution, the questionnaire was reviewed by experts in environmental education to ensure content validity and clarity of language.

The collected data were processed through editing, coding, and tabulation procedures before statistical analysis. Descriptive statistical techniques were employed to calculate frequencies, percentages, means, and standard deviations for each indicator. To facilitate interpretation, the environmental literacy scores were categorized into five levels: very low, low, moderate, high, and very high. The results were presented through tables, graphs, and descriptive narratives to provide a comprehensive overview of the environmental literacy profile of boarding house students in Medan Tembung District.

The analysis focused on identifying patterns of environmental literacy across the three dimensions and examining the extent to which boarding house students demonstrate environmentally responsible attitudes and behaviors in their daily lives.

Results and Discussion

Overall Environmental Literacy of Boarding House Students

The findings indicate that the environmental literacy level of boarding house students in Medan Tembung District is generally categorized as **good** across all measured dimensions. Environmental attitudes and boarding environment support obtained the highest average scores

(M = 4.31), followed by pro-environmental behavior (M = 4.24) and environmental knowledge (M = 4.21).

Based on the recapitulation table, the level of environmental literacy of boarding school students in Medan Tembung District is in the good category in all dimensions measured. The dimensions of environmental attitudes and support of boarding schools showed the highest average scores, indicating that individual concern and environmental conditions played an important role in shaping students' environmentally friendly behaviors.

Table 2. Recapitulation of Environmental Literacy Level of Boarding School Students

Environmental Literacy Dimension	Key Indicators	Average Score	Category
Environmental Knowledge	Understanding global warming, plastic hazards, waste management, 3R concepts	4,21	Good
Environmental Attitudes	Concern for cleanliness, environmental responsibility, boarding house comfort	4,31	Good
Pro-Environmental Behavior	Dispose of waste in place, energy and water savings, plastic reduction	4,24	Good
Boarding Environment Support	Boarding Environment Support Availability of cleaning facilities, boarding house management, environmental conditions	4,31	Good

Remarks: The categories of environmental literacy scores are determined by the intervals: 1.00–2.33 (Low), 2.34–3.66 (Fair), and 3.67–5.00 (Good).

The findings suggest that environmental literacy among boarding house students is not merely determined by cognitive understanding but is also strongly influenced by affective and contextual factors. According to the environmental literacy framework proposed by Roth (1992), environmental literacy encompasses knowledge, attitudes, skills, and responsible behavior toward the environment. The relatively high scores across all dimensions indicate that respondents possess a balanced combination of these components.

Furthermore, the strong role of environmental support confirms the socio-ecological perspective suggesting that environmentally responsible behavior is shaped not only by individual awareness but also by environmental conditions and social structures surrounding individuals (Bronfenbrenner, 1979). In the context of boarding houses, the availability of waste bins, sanitation facilities, and environmentally supportive management practices may facilitate environmentally responsible behavior among residents.

The dimension of environmental knowledge is also in the good category, indicating that students have an adequate understanding of key environmental issues, both in global and local contexts. This understanding is the basis for forming a positive attitude towards the environment.

Meanwhile, the pro-environmental behavior dimension is in the good category, but relatively lower than the attitude dimension. These findings show that even though students have good knowledge and attitudes, the consistency of environmentally friendly behavior is still influenced by supporting factors, especially the availability of facilities and the management of the boarding house environment.

Overall, the results of the study confirm that students' environmental literacy is not only influenced by individual factors, but also by the support of the residential environment, so that the role of boarding house managers and the provision of adequate facilities are important factors in encouraging pro-environmental behavior.

Table 3. Environmental Knowledge Answer Distribution

No	Statement	SS	S	CS	TS	STS
1	I know that waste that is not managed properly can pollute the environment	32	11	1	2	4
2	I know that plastic waste takes a very long time to decompose	29	11	3	3	4
3	I know that the use of single-use plastics is bad for the environment	25	16	3	2	4
4	I understand the importance of keeping public spaces clean	29	14	2	1	4
5	I know that an individual's hygiene behavior can affect the surrounding environment	26	17	4	1	2

Environmental Knowledge

The results demonstrate that respondents possess a relatively strong understanding of environmental issues. Most respondents agreed that improper waste management contributes to environmental pollution, that plastic waste requires a very long time to decompose, and that excessive use of single-use plastics negatively affects environmental sustainability.

Table 4. Distribution of Environmental Knowledge Responses

Indicator	Dominant Response
Waste causes environmental pollution	Strongly Agree
Plastic takes a long time to decompose	Strongly Agree
Single-use plastics harm the environment	Agree
Importance of public cleanliness	Strongly Agree
Individual behavior affects the environment	Agree

These findings indicate that environmental information has been widely disseminated among young adults through formal education, social media, and environmental campaigns. This supports previous studies demonstrating that Generation Z tends to possess higher environmental awareness due to their extensive exposure to digital information and sustainability discourse (Francis & Hoefel, 2018).

However, environmental literacy scholars argue that knowledge alone does not automatically lead to environmentally responsible behavior (Kollmuss & Agyeman, 2002). Individuals may understand environmental problems but fail to translate that understanding into consistent environmental action due to situational constraints, lack of motivation, or insufficient environmental support. Therefore, knowledge should be viewed as a necessary but insufficient condition for fostering pro-environmental behavior.

Environmental Attitudes

Environmental attitudes obtained the highest average score among all dimensions. Respondents expressed strong concern regarding environmental cleanliness and agreed that a

clean environment contributes significantly to quality of life. The high level of environmental concern reflects positive environmental values among boarding house students. According to the Theory of Planned Behavior (Ajzen, 1991), positive attitudes toward environmental protection can increase an individual's intention to engage in environmentally responsible behavior. Respondents generally perceived environmental cleanliness as a shared responsibility rather than solely the responsibility of government institutions.

The findings also reveal that respondents support environmental regulations and community initiatives promoting environmental cleanliness. Such attitudes are important because they represent an affective foundation that can encourage collective environmental action. Previous research has shown that positive environmental attitudes significantly predict participation in environmental conservation activities and sustainable lifestyle practices (Steg & Vlek, 2009).

Nevertheless, a small proportion of respondents still reported neutral responses regarding intervening when others litter. This suggests that while environmental concern is relatively high, social enforcement of environmental norms remains moderate. Similar findings have been reported by Bamberg and Möser (2007), who found that environmental attitudes often exceed actual willingness to intervene in environmentally harmful behaviors.

Table 5. Distribution of Attitudes to the Environment Response

No	Statement	SS	S	CS	TS	STS
1	I feel concerned about cleanliness and environmental sustainability	25	16	3	1	5
2	I believe that a clean environment can improve people's quality of life	28	15	1	2	4
3	I feel the need to dispose of garbage in the right place	19	18	4	3	6
4	I care when I see friends or other people littering	21	17	6	3	3
5	I support the existence of activities or rules that encourage environmental cleanliness	22	16	6	3	3

Environmental Awareness

In the aspect of environmental awareness, respondents showed a relatively high level of awareness. Most respondents understand that every individual action has consequences for environmental conditions. This is shown by the high acceptance of the statement that daily behavior can have a positive or negative impact on the environment. This awareness is an important foundation in encouraging the formation of more responsible behavior.

Awareness to reduce the use of single-use plastics also looks quite strong. Many respondents stated that they felt the need to replace plastic with eco-friendly alternatives such as tumblers or totebags. This shows that Gen Z has understood the global issues related to plastic waste and is working to adopt more sustainable habits.

In addition, respondents also showed a good understanding of the importance of maintaining the cleanliness of public places, both roads, parks, and other public spaces. The majority of respondents agreed that keeping public areas clean is a shared responsibility. Willingness to participate in environmental activities or campaigns, such as clean-up actions or plastic reduction campaigns, is also quite high, although there are still a small percentage of respondents who are neutral.

Furthermore, the awareness that negative actions such as littering can cause unpleasant odors and damage the scenery are also understood by almost all respondents. This strong understanding shows that Gen Z has a realistic perception of the consequences of unenvironmentally friendly behavior. Overall, the data showed that the level of environmental awareness of respondents was in the high category. This awareness is an important capital in supporting the creation of pro-environmental behavior in the community, especially in urban areas such as Medan Sunggal.

Table 5. Environmental Awareness Answer Distribution

No	Statement	SS	S	CS	TS	STS
1	I am aware that my every action can have an impact on the environment	26	17	3	1	3
2	I feel the need to reduce the use of plastic, for example using tumblers or totebags	19	19	7	1	4
3	I am aware of the importance of maintaining the cleanliness of public places such as roads, parks, and hangout places	30	14	1	1	5
4	I would like to participate in an environmental activity or campaign if there is one Opportunity	18	22	5	0	5
5	I realized that littering can create smell and spoil the scenery	24	19	1	1	5

Environmental awareness among respondents was also found to be high. Most students acknowledged that individual actions contribute directly to environmental quality and recognized the importance of reducing plastic consumption.

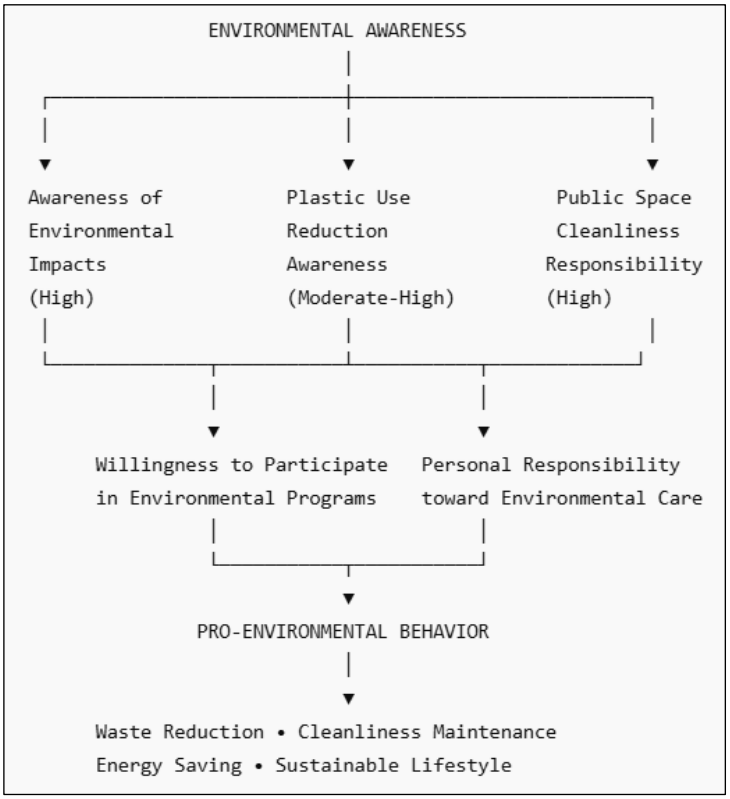

Figure 1. Conceptual Framework of Environmental Awareness among Boarding House Students

Figure 1 illustrates the conceptual relationship between environmental awareness and pro-environmental behavior among boarding house students. The findings indicate that environmental awareness is manifested through several dimensions, including awareness of environmental impacts, responsibility for public cleanliness, reduction of single-use plastic consumption, and willingness to participate in environmental activities. These dimensions collectively contribute to the development of pro-environmental behavior, such as proper waste disposal, maintaining residential cleanliness, reducing resource consumption, and adopting sustainable lifestyles. This finding supports the argument that environmental awareness functions as an important antecedent of environmentally responsible behavior (Bamberg & Möser, 2007; Steg & Vlek, 2009; Stern, 2000).

The willingness of respondents to participate in environmental campaigns and community-based environmental activities indicates the emergence of environmental citizenship. Environmental citizenship refers to responsible environmental behavior undertaken not only for personal benefits but also for broader societal and ecological sustainability (Dobson, 2007).

Interestingly, respondents demonstrated particularly strong awareness regarding public-space cleanliness. This finding may be associated with their daily interaction with shared facilities within boarding-house environments. Shared living arrangements often increase awareness of collective responsibility because environmental neglect directly affects all residents.

These findings support UNESCO's (2021) argument that environmental literacy development should emphasize environmental awareness and civic participation, not merely environmental knowledge. Individuals who are environmentally aware are more likely to become active agents of environmental protection within their communities.

Waste Management Behavior

The respondents' waste management behavior showed a positive trend. They stated that they used to throw garbage in its place when outside the house, try to reduce the use of plastic, and do not throw garbage into rivers, sewers, or roadsides. Some respondents also mentioned that they were willing to take home garbage if they could not find a public garbage can. In addition, the habit of maintaining the cleanliness of the residence and the environment around the house is quite strong, indicating the internalization of good habits in daily life.

Daily Hygiene Habits

Respondents showed the habit of maintaining good hygiene in daily activities. They are used to maintaining cleanliness when they are at school, campus, or work. The habit of not leaving garbage in hangout places such as cafes or parks stands out. In addition, respondents try to place garbage according to their type if facilities are available, as well as tidy up the place used after activities. Maintaining personal hygiene, such as washing hands and taking care of personal belongings, is also part of Gen Z's routine habits.

Social Responsibility to the Environment

In the aspect of social responsibility, respondents showed high participation. They do not hesitate to remind friends who throw garbage carelessly and try not to cause pollution, such as avoiding burning garbage. The influence of positive trends such as zero waste and green lifestyle is also seen in their behavior. In addition, respondents are willing to participate in cleaning activities if invited by the community or friends. Not only that, they also perform small actions such as picking up garbage or maintaining cleanliness without being told, showing the emergence of collective awareness as part of social responsibility.

The results of the study show that Gen Z in Medan Sunggal has a high level of environmental literacy, both in terms of knowledge, attitude, and awareness. This high level of

environmental literacy is in line with the characteristics of Gen Z who are known as a generation that is more information literate and has concern for social issues, including the environment. Good knowledge of the impact of waste and plastics contributes to a positive attitude and willingness to take care of the environment. In addition, Gen Z's hygiene behavior also reflects the internalization of environmental values in daily life. The habit of throwing garbage in its place, sorting garbage, keeping public spaces clean, and participating in environmental actions shows that environmental literacy does not only stop at knowledge, but also transforms into real actions.

The social responsibility shown by the respondents such as reminding friends and participating in environmental campaigns indicates the emergence of a culture of environmental care that develops among Gen Z. This shows that good environmental literacy can encourage prosocial behavior and form a community that is more concerned about environmental sustainability.

Overall, high environmental literacy in Gen Z has the potential to be a strong capital in improving environmental quality in the Medan Sunggal area. These findings provide an important basis for local governments, schools, campuses, and environmental communities to continue to strengthen environmental education programs and campaigns to support long-term sustainability.

Pro-Environmental Behavior

Although environmental behavior was categorized as good, its average score was slightly lower than environmental attitudes and awareness. This finding suggests the existence of a knowledge–behavior gap, a phenomenon frequently observed in environmental education research (Kollmuss & Agyeman, 2002).

Respondents reported regularly disposing of waste properly, reducing plastic use, maintaining cleanliness in public spaces, and participating in environmental activities. Such practices indicate that environmental values have been partially translated into everyday behavior.

However, some environmentally responsible behaviors, particularly waste separation and participation in environmental programs, were less consistently practiced. One possible explanation is the limited availability of supporting infrastructure within boarding-house environments. Environmental behavior often depends on enabling conditions such as accessible recycling facilities, environmental regulations, and institutional support (Stern, 2000).

Therefore, improving environmental literacy should not focus exclusively on individual education but should also involve creating supportive environmental systems that facilitate sustainable behavior.

The Role of Boarding House Environmental Support

One of the most significant findings of this study is the strong influence of boarding-house environmental support. Respondents perceived that environmental facilities and management practices contributed positively to maintaining environmental cleanliness.

This finding aligns with ecological systems theory, which emphasizes that human behavior develops through continuous interaction with environmental contexts (Bronfenbrenner, 1979). In boarding-house settings, environmental facilities function as behavioral cues that encourage residents to adopt environmentally responsible practices.

Previous studies have similarly found that supportive physical environments significantly influence sustainable behavior among university students and young adults (Ardoin et al., 2020; Monroe et al., 2019). The availability of waste bins, clean communal spaces, environmental regulations, and active management can strengthen environmental norms and facilitate behavioral consistency.

Consequently, environmental literacy enhancement programs should not only target

individual awareness but also strengthen environmental governance within boarding-house communities.

Implications for Environmental Education

The findings suggest that environmental literacy among boarding house students has reached a relatively satisfactory level. Nevertheless, the slightly lower score of pro-environmental behavior compared with environmental attitudes and awareness indicates the need for interventions aimed at bridging the knowledge–action gap.

Environmental education programs should therefore move beyond information dissemination and incorporate experiential learning approaches, community participation, environmental campaigns, and behavior-based interventions. Such approaches have been shown to improve environmental responsibility more effectively than knowledge-based instruction alone (Ardoin et al., 2020; UNESCO, 2021).

In addition, boarding-house managers should be actively involved in promoting environmental sustainability through the provision of adequate facilities, environmental regulations, and collaborative environmental initiatives. Strengthening environmental support systems may contribute significantly to translating environmental literacy into long-term sustainable behavior among young adults.

Conclusion

This study concludes that the environmental literacy level of boarding house students in Medan Tembung District is generally categorized as good across the dimensions of environmental knowledge, attitudes, pro-environmental behavior, and environmental support. The findings indicate that respondents possess adequate knowledge regarding environmental issues, particularly waste management, plastic pollution, and environmental conservation. Such knowledge is reflected in positive environmental attitudes characterized by concern for environmental cleanliness, awareness of individual responsibility, and support for environmental protection initiatives.

Furthermore, the study reveals that environmental awareness among respondents has developed relatively well, as evidenced by their willingness to reduce plastic consumption, maintain public cleanliness, and participate in environmental activities. Although pro-environmental behavior was also categorized as good, its score was slightly lower than the attitude and awareness dimensions, suggesting the existence of a knowledge–behavior gap in which positive environmental values are not always consistently translated into daily practices. This finding confirms that environmental literacy is influenced not only by individual cognitive and affective factors but also by contextual factors, particularly the support provided by the boarding-house environment.

The study highlights the important role of environmental facilities, management practices, and social norms within boarding-house communities in fostering environmentally responsible behavior. Therefore, efforts to improve environmental literacy should not be limited to increasing environmental knowledge but should also focus on strengthening environmental support systems and creating opportunities for active participation in sustainability initiatives.

These findings contribute to the growing body of environmental literacy research by demonstrating that boarding-house environments can serve as important settings for cultivating sustainable behavior among young adults. Future studies are recommended to employ larger samples and inferential statistical analyses to further examine the relationships among environmental knowledge, attitudes, awareness, environmental support, and pro-environmental

behavior.

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