

Internalizing Environmental Care Values Through Waste Management: Impacts on Elementary Students' Social Relations

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Abstract: Environmental issues, particularly waste management, have emerged as one of the most pressing challenges in sustainable development globally. This study analyses the process of internalizing environmental care values through waste management and its impact on students' social relations at SDN 154 Aek Ngali. A qualitative case study design was employed, and data were collected through participatory observation, in-depth interviews, and documentation. The findings demonstrate that the internalization of environmental care values proceeds through four interconnected mechanisms: habituation, teacher modeling, positive reinforcement, and social collaboration. Daily class duty schedules and routine communal cleaning activities not only build students' ecological consciousness but also strengthen cooperation, solidarity, and interpersonal communication, and reduce interpersonal conflict among students. Waste management in schools thus functions as an integrative socio-ecological educational medium in which the formation of ecological awareness proceeds hand in hand with the strengthening of social relations. This study contributes theoretically to environmental-based education by emphasizing the social dimension as a critical outcome of ecological practices at the elementary school level. It provides a practical basis for developing waste management programs oriented not only toward environmental cleanliness but also toward fostering a collaborative and sustainable social culture.

Keywords: internalization of values, environmental care, waste management, social relations, elementary school.

INTRODUCTION

Environmental issues, particularly waste management, represent one of the most serious challenges in sustainable development faced by global society. Escalating population growth, rapid urbanization, and rising consumption have caused global solid waste generation to increase sharply, threatening public health and environmental quality, especially in low- and middle-income countries (Das et al., 2019; Jebaranjitham et al., 2022; A. H. Khan et al., 2022; S. Khan et al., 2022; Sharma & Jain, 2020). Weak management systems, including open dumping, burning, and minimal recycling, exacerbate air, soil, and water pollution while impeding the achievement of the Sustainable Development Goals (SDGs) relating to sustainable cities, health, clean water, and climate (Awino & Apitz, 2024; A. H. Khan et al., 2022). Addressing this crisis requires not only technological and policy interventions but also a fundamental transformation in how societies cultivate

environmental awareness across generations. Education, particularly at the foundational level, represents one of the most strategic and enduring responses to the global waste challenge, as values and habits formed in early childhood tend to persist and shape long-term behavioral patterns (Kelly et al., 2023). Schools, therefore, are not merely sites of academic instruction but serve as critical arenas for the early formation of environmental consciousness, responsible citizenship, and sustainable lifestyles. Embedding environmental care values within formal schooling from the earliest stages is increasingly recognized as an imperative, not a supplement, to achieving meaningful and lasting progress in waste management and broader sustainability goals.

In Indonesia, the continuously increasing volume of solid waste demands the involvement of various parties, including formal educational institutions, not merely to convey information but to transform environmental care values from an early age. Environmental care character formation that encompasses cognitive, affective, and psychomotor dimensions constitutes a strategic goal in sustainability-oriented education for students (Khoerunisa, 2024). Education is no longer understood solely as a process of knowledge transfer but as one of shaping consciousness, attitudes, and sustainable social practices, positioning schools as strategic agents for the transformation of environmental value.

Elementary schools, as the first systematic educational units, occupy a strategic position in building students' character foundations. Children at this developmental phase are in a period of habit and value formation that tends to be relatively stable over the long term, making environmental value internalization at this level a long-term social investment in building a sustainability-oriented generation (Liang et al., 2022). Internalization of values does not occur instantaneously; rather, it proceeds through a systematic, consistent, and contextual pedagogical process so that values become integrated into the daily thinking patterns and behaviors of students (Kelly et al., 2023).

The transformation of environmental care values is not solely related to the mastery of ecological concepts but also involves social processes encompassing habituation, collaborative practice, and interpersonal interactions within the school environment. Participatory environmental education, such as waste sorting and class cleaning activities, has been shown to enhance students' environmental competencies while simultaneously strengthening their social engagement in collective activities (Girsang & Situmeang, 2023; Utami et al., 2025). In this context, waste management in elementary schools functions not only as a technical strategy for maintaining cleanliness but also as a social learning medium that shapes interpersonal relations, solidarity, shared responsibility, and collective norms among students.

Numerous recent studies in elementary schools affirm the importance of 3R-based waste management programs (Reduce, Reuse, Recycle) in the context of character education. Integrated habituation of waste management within learning activities has been demonstrated to improve ecological consciousness as well as social skills such as cooperation and responsibility among students (Nada et al., 2021; Utami et al., 2025). Nevertheless, empirical studies that specifically examine the relationship between the internalization of environmental care values through waste management and its impact on students' social relations remain limited, with most research focusing on environmental literacy improvement, individual behavioral change, or technical effectiveness of 3R programs, leaving socio-interpersonal dimensions such as solidarity strengthening and cooperative dynamics largely unexplored.

The significance of environmental education at the elementary level extends beyond ecological literacy. Schools constitute microcosms of society in which students not only acquire academic knowledge but also develop their social identities, moral orientations, and relational competencies through everyday interactions and shared practices (Pas et al., 2018). When environmental care activities such as waste management are embedded within the school's daily routines, they simultaneously function as platforms for developing prosocial behaviors, including cooperation, empathy, and collective responsibility. This dual function, ecological and social, distinguishes practice-based environmental education from conventional instructional approaches and underscores its transformative potential in character formation (Nada et al., 2021). Understanding the mechanisms through which these dual outcomes are achieved is therefore critical for designing effective, integrated school-based environmental programs.

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Despite growing attention to environmental education, three distinct gaps remain in the existing literature. First, there is a theoretical gap: existing

frameworks have not sufficiently integrated ecological practice theory with social relations theory to explain how school-based waste management simultaneously produces environmental and interpersonal outcomes. Second, an empirical gap is evident: most studies focus narrowly on environmental literacy improvement or individual behavioral change, while socio-interpersonal dimensions such as solidarity formation, cooperative dynamics, and conflict reduction as outcomes of ecological school programs remain largely unexamined. Third, a content gap persists in the Indonesian context: context-specific studies on value internalization through waste management in local elementary schools, particularly in regions such as Mandailing Natal, are scarce, despite evidence that learning culture and social interaction in schools significantly shape students' habits and values in this setting (Suadi et al., 2022). These findings reinforce the relevance of practice-based and habituation approaches as mechanisms for value internalization in local educational contexts, making context-specific investigation of SDN 154 Aek Ngali both timely and necessary. Addressing these theoretical, empirical, and content gaps, this study aims to analyze in depth the process of internalizing environmental care values through waste management at SDN 154 Aek Ngali and to identify its impacts on students' social relations.

METHOD

This study employed a qualitative approach with a case study design. The qualitative approach was selected because the study aims to understand in depth the process of internalizing environmental care values through waste management and its impact on students' social relations within the natural school context, focusing not merely on observable behavioral outcomes but also on the meanings, subjective experiences, and social dynamics underlying the formation of those behaviors (Creswell & Poth, 2018).

The case study design was applied to comprehensively explore the phenomenon at SDN 154 Aek Ngali, taking into account the social characteristics, school culture, and interaction patterns that developed within that setting (Creswell & Poth, 2018). This approach is relevant because value internalization is a contextual process heavily influenced by school organizational culture, enabling the researcher to provide a thick description of field realities, including the institutional context, school policies, and habits that shape waste management practices.

Data were collected through three primary techniques. First, participatory observation was conducted throughout the research period to directly observe waste management activities, student interaction patterns, and value internalization mechanisms occurring within the school's daily routines. Second, in-depth interviews were conducted with the principal, classroom teachers, and students to

obtain information regarding their perceptions, experiences, and interpretations of waste management activities and their impacts on social relations. Third, documentation was gathered from various sources, including field notes, duty schedules, school cleanliness policies, and activity photographs, to strengthen data validity (Moleong, 2017).

Data analysis followed the interactive analysis model encompassing data reduction, data display, and conclusion drawing (Miles et al., 2014). Data trustworthiness was ensured through source and technique triangulation, member checking with informants, and extended observation periods to verify consistency of findings.

RESULTS AND DISCUSSION

Environmental Value Education in Elementary Schools

Environmental care constitutes one of the values receiving serious attention in the world of education. Value education can be understood as the process of forming positive habits in students so that they not only understand cognitively but also internalize affectively and habituate themselves to manifesting values in real actions (Florian & Beaton, 2024). Through this process, students are expected to make wise decisions and contribute positively to both their personal and social lives. Environmental care character education must encompass cognitive, affective, and psychomotor dimensions so that students not only understand ideas but also are willing and able to act positively toward the environment (Handayani et al., 2024). The goal of environmental character education is to produce generations that are not merely cognitively intelligent but also aware, responsible, and capable of acting to preserve the environment (Khoerunisa, 2024).

As social spaces that shape student behavior, schools need to offer learning experiences and genuine activities that reflect environmental care. A positive school climate, including clear rules and emotional support from teachers, plays an important role in instilling values such as responsibility and respect while reducing negative behaviors (Pas et al., 2018). The Adiwiyata program is one of the primary efforts to instill environmentally friendly principles in schools, with indicators of environmental care attitudes, including environmental maintenance, reduction of plastic use, waste management, and knowledge of waste sorting (Handayani et al., 2024). The Adiwiyata program in Islamic elementary schools has been shown to successfully form environmentally caring characters through systematic habituation and strong institutional support (Fikri et al., 2022).

Environmental care values are not formed instantly but require a gradual and continuous process. Observations at SDN 154 Aek Ngali still revealed that

students had not fully developed awareness of the need to maintain the cleanliness of the school environment. Elementary school students' level of understanding regarding environmental care remains relatively low, necessitating a systematic educational approach through learning activities and direct outdoor practices (Siskayanti & Chastanti, 2022). Environmentally-based learning in elementary schools can foster an early awareness of environmental issues, especially when combined with hands-on activities such as waste sorting (Utami et al., 2025).

Waste Management Program

SDN 154 Aek Ngali implements various waste management programs integrated within the school's daily routines, encompassing a class duty system, organic and inorganic waste sorting, and weekly communal cleaning activities. Through environmental cleanliness and conservation socialization, students are expected to develop a sufficient understanding of the importance of maintaining the living environment. Schools, as formal educational institutions, play a strategic role in cultivating environmental awareness from an early age, and the implementation of environmentally-based education in schools greatly enhances children's environmental care character (Khoerunisa, 2024). Weekly communal cleaning activities involve all students, and through these routine activities, students are expected to develop environmental care habits that ultimately become lasting character traits.

Various efforts to instill environmental care values are integrated within environmentally oriented school programs such as the Adiwiyata program (Anwari, 2014). The implementation of 3R principles in school-based waste management activities has been demonstrated to increase students' environmental literacy while simultaneously strengthening the formation of a collective character oriented toward responsibility (Girsang & Situmeang, 2023). Waste management and cleanliness habituation at SDN 154 Aek Ngali can thus be understood as part of a value education strategy that integrates cognitive, affective, and psychomotor aspects to build sustainable environmental consciousness and practice.

Process of Internalizing Environmental Care Values

Based on observation and interview results, the process of internalizing environmental care values at SDN 154 Aek Ngali proceeds through four main mechanisms that mutually complement one another: habituation, teacher modeling, positive reinforcement, and social collaboration. These four mechanisms are theoretically grounded in two grand theories that underpin this study's analytical framework. First, Bourdieu's (1984) theory of habitus provides the conceptual lens through which repeated ecological practices are understood as generating durable dispositions, internalized schemes of perception and action that become second

nature to students over time. Second, Bandura's (1977) social learning theory explains how students acquire pro-environmental behaviors not only through direct instruction but through observation, imitation, and social reinforcement within their school environment. Together, these two theoretical frameworks illuminate how individual habit formation and social modeling interact to produce lasting value internalization in the school context

Habituation is the primary foundation of the internalization process for environmental care values. Daily routines such as class duty, organic and inorganic waste sorting, and weekly communal cleaning form patterns of behavior repeated consistently over time. Students are directed not only to place waste in designated bins. However, they are also taught to understand the reasons behind these actions, such as the impacts of waste on health and the comfort of the school environment. This repetitive process gradually forms a new habitus within students (Bourdieu, 1984). Maintaining cleanliness is no longer perceived as an external instruction but as an internal need and moral responsibility, with several students reporting feeling uncomfortable upon seeing scattered waste, indicating a shift in values from compliance to genuine internalization.

Teacher modeling plays a central role in strengthening the internalization process. Teachers consistently demonstrate environmentally caring behavior, such as sorting waste before disposal, persuasively correcting students who are disorderly, and directly participating in cleaning activities. Observations showed that students tend to imitate teacher behavior without needing repeated instructions, a phenomenon reflecting social learning processes in which students learn through observation and imitation of authoritative figures (Bandura, 1977). Teacher and peer modeling have been confirmed as the primary determinants in building pro-environmental behavior in children aged 7–13 years (Liang et al., 2022).

Positive reinforcement is applied through verbal appreciation and public recognition of students who consistently demonstrate environmentally caring behavior. Rewarding the cleanest classroom drives collective motivation to maintain and improve cleanliness habits. The systematic development of social responsibility through positive reinforcement mechanisms in elementary school students contributes significantly to the acceleration of the internalization of prosocial and pro-environmental behavior (Martín-Antón et al., 2020).

Social collaboration in waste management is conducted in groups through both the duty system and communal cleaning. This pattern encourages students to share tasks, discuss, and coordinate to complete cleaning responsibilities, learn to manage differences, agree on divisions of labor, and help one another when a classmate encounters difficulties. These collaborative activities create cooperative

learning experiences that strengthen social skills such as effective communication, empathy, and negotiation (Mendo-Lázaro et al., 2018).

Taken together, the four internalization mechanisms mutually complement one another, forming a sustainable value education system. Internalization does not stop at individual behavior change but develops into a collective norm that reinforces school culture. Ecological practices in schools carry transformative impacts extending beyond the technical-environmental dimension into the formation of students' social identities and the cultivation of biospheric values that tend to be stable across generations (Kelly et al., 2023; Nada et al., 2021).

Impact on Students' Social Relations

The findings of this study demonstrate that the waste management program not only enhances ecological consciousness but also exerts significant positive impacts on four dimensions of students' social relations.

The first impact is the strengthening of cooperation among students. Class duty activities, communal cleaning, and waste sorting require task distribution and coordination. Students learn to agree on each person's role, such as sweeping, collecting waste, sorting waste types, and disposing of waste appropriately, training their ability to work within a team and building awareness that the success of a task depends on each member's contribution. Positive reciprocal relationships in group activities in elementary schools correlate strongly with improved academic performance and social cohesion among students (Candia et al., 2022).

The second impact is the growth of solidarity and collective responsibility. Collective cleanliness activities build awareness that the cleanliness of the school environment is the shared responsibility of all members of the school community, not any single individual. Several students expressed feeling uncomfortable when they allowed a classmate to work alone during class duty, reflecting empathy and social care that develop through shared experience. Children's involvement in cooperative activities, including school community activities, significantly influences prosocial behavior and the quality of peer relationships at the elementary school age (Volodina, 2022).

The third impact is a reduction in social conflict among students. Communal activities in waste management create a more conducive atmosphere of togetherness, with students accustomed to working collaboratively tending to find it easier to understand differences and appreciate each other's contributions. Teachers reported that the potential for minor conflicts between students, such as mutual blame or reluctance to cooperate, diminished progressively as consistent group work routines were established. The systematic development of social responsibility through group activities among elementary school students

contributes significantly to reducing interpersonal conflict and enhancing prosocial skills (Martín-Antón et al., 2020).

The fourth impact is the improvement in the quality of interpersonal communication. Group-based waste management activities encourage students to express opinions, listen to others, and negotiate in resolving practical problems. Teachers observed that students who are actively involved in waste management activities tend to be more expressive and assertive in classroom communication. Cooperative learning methods have been established as effective in developing students' interpersonal, social, and teamwork competencies that are decisive in their professional and social success (Mendo-Lázaro et al., 2018).

These findings collectively indicate that waste management at SDN 154 Aek Ngali functions as an integrative socio-ecological educational medium. The relationship between ecological practices and the strengthening of social relations is not merely an incidental side effect. However, it forms part of a consciously designed learning framework by teachers and school leadership. Biospheric values developed through environmental programs in elementary schools carry significant cross-generational impacts, as values internalized in early childhood tend to be more stable and integrated into the moral identity of individuals (Kelly et al., 2023).

This study further found that the strength of the internalization model at SDN 154 Aek Ngali lies in the consistency between values explicitly taught in the classroom and those implemented concretely in school routines. The integration of environmental care values into school policies, classroom culture, and teacher behavior creates a cohesive value ecosystem in which students not only learn about the environment but also live by these values every day. This approach is consistent with the whole-school approach concept in environmental education, emphasizing the importance of synergy between the formal curriculum, school culture, and community involvement to achieve sustainable value transformation (Nada et al., 2021; Utami et al., 2025).

Theoretical and Practical Contributions

This study makes several significant contributions to the development of knowledge in the fields of environmental education and character education. Theoretically, this study advances the understanding of value internalization by demonstrating that Bourdieu's habitus theory and Bandura's social learning theory are not merely complementary but mutually reinforcing frameworks when applied to school-based ecological practices. The findings show that habitus formation through repeated ecological routines and social learning through modeling and reinforcement operate simultaneously, producing a compounding effect on the depth and stability of environmental care values in elementary school students. This

integrated theoretical perspective offers a more comprehensive explanatory model than single-framework approaches commonly employed in prior studies.

Furthermore, this study contributes empirically by establishing a direct and systematic link between waste management practices and socio-interpersonal outcomes, cooperation, solidarity, conflict reduction, and communication quality that have been largely overlooked in the environmental education literature. By demonstrating that ecological school practices produce measurable social relational benefits, this study extends the theoretical boundaries of environmental education beyond individual behavioral change toward a relational and communal dimension of character formation.

From a practical standpoint, the findings provide an evidence-based framework for school administrators and policymakers to design waste management programs that are oriented not only toward environmental cleanliness but also toward the deliberate cultivation of students' social competencies. The four-mechanism model identified in this study, habituation, teacher modeling, positive reinforcement, and social collaboration, offers a replicable and adaptable framework for schools seeking to develop integrated socio-ecological education programs. In the Indonesian context, where environmental challenges and character education imperatives converge, this study provides actionable guidance to strengthen school-based environmental programs as dual-purpose instruments for ecological and social development.

CONCLUSION

This study demonstrates that the internalization of environmental care values through waste management at SDN 154 Aek Ngali proceeds through four interconnected mechanisms: habituation, teacher modeling, positive reinforcement, and social collaboration, which collectively transform individual compliance into genuine ecological consciousness and shared cultural norms. Beyond environmental outcomes, collective waste management activities deliver significant positive impacts on students' social relations: strengthening cooperation and solidarity, reducing interpersonal conflict, and improving the quality of peer communication, thereby establishing waste management as an integrative socio-ecological educational medium rather than a purely technical school program. Theoretically, this study affirms that ecologically practice-based education carries a significant social dimension in the formation of students' values and identities; practically, it recommends that schools embed waste management consistently within culture and policy to simultaneously advance environmental consciousness and social cohesion, while future research should extend this inquiry to schools with diverse socioeconomic contexts to broaden generalizability.

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