GREENING EDUCATION: STORIES OF SCHOOLS IMPLEMENTING BEST ENVIRONMENTAL PRACTICES

LORNIE JANE T. IMLAHI
Central Mindanao Colleges, Kidapawan City, Philippines.
Corresponding email: limlahi@cmc.edu.ph

ABSTRACT

This study explores the experiences of educators in implementing effective environmental practices within their schools using a qualitative narrative research design. Aiming to understand both the process and impact of these initiatives, the study involved 17 YES-O advisers from various small and large schools in the Municipality of Isulan. Findings indicate that teachers' leadership and modeling of environmental responsibility, coupled with creativity, resourcefulness, and consistent engagement, shape the success of environmental practices. Effectiveness is further influenced by resource availability, adaptive strategies, community collaboration, parental involvement, and supportive school leadership and policies. Teachers also reported gaining insights into shifting mindsets toward integrated environmental values, empowering students to act as environmental stewards, and applying practical, collaborative approaches to sustain initiatives. These results suggest that teacher-led, collaborative, and adaptive strategies play a critical role in fostering sustainable environmental practices in schools.

Keywords: *Environmental Education, YES-O Advisers, Sustainability, Student Engagement, School Practices, Qualitative Research, Central Isulan District*

INTRODUCTION

The urgency of climate change and environmental degradation has placed increasing pressure on educational systems worldwide to instill sustainable practices in schools. However, translating these goals into effective daily implementation remains a global challenge. Cheang, Goldman, and Berglund (2019) revealed that fewer than half of schools that claim to support environmental initiatives actually adopt practical programs such as recycling, energy conservation, or eco-gardening. Despite widespread awareness, many educators feel ill-equipped to lead these efforts. Pamuk (2023) found that although 81% of teachers believe environmental education is essential, only 52% feel confident in applying best practices in the classroom. The lack of structured training, curriculum integration, and institutional support often undermines meaningful engagement with sustainability.

In the Philippines, while some private schools have made progress in areas like water management and air quality measures, other aspects, including solid waste segregation and green procurement policies, remain weak or inconsistently applied (Ilarde, 2022). Nationally, over 70% of public schools still lack basic Water, Sanitation, and Hygiene (WASH) facilities, significantly limiting the capacity to practice sustainable environmental behaviors (UNICEF Philippines, 2023). Teachers also report inadequate training, limited time, and poor coordination as barriers to promoting environmental

education in schools (Salóte et al., 2020). These local challenges suggest that while environmental awareness exists, the experiences of educators and students in carrying out these practices remain hindered by structural and systemic limitations.

Locally, the Department of Education (DepEd) in Isulan has actively promoted greening education by implementing programs such as the Youth for Environment in Schools Organization (YES-O), Gulayan sa Paaralan, and solid waste management initiatives. Recent data shows that approximately 75% of schools in the municipality have integrated these environmental practices into their curriculum and school activities, leading to increased student awareness and participation in sustainability efforts (Garcia, 2022). These initiatives are essential in a community like Isulan, where environmental challenges persist due to limited resources and rapid urbanization, as they foster responsible behavior and help build a culture of environmental stewardship among young learners (Reyes & Cruz, 2021).

Despite an increasing body of research on environmental education, there is still a lack of comprehensive understanding about the real-life experiences of those involved in implementing environmental practices in schools. Much of the existing literature focuses on quantitative outcomes or policy frameworks but rarely delves into the qualitative aspects of how educators and students perceive and navigate these initiatives (Garcia & Patel, 2023; Williams et al., 2021). Furthermore, there is limited exploration of how contextual factors such as school culture, local community involvement, and resource availability influence the success or failure of environmental programs (Almeida & Carvalho, 2019). This study aims to fill this gap by providing in-depth qualitative insights into the lived experiences of school stakeholders, offering valuable perspectives to improve the design and implementation of environmental practices in education.

This study offers valuable insights that can enhance educational approaches to environmental sustainability by highlighting the real-world experiences of those involved in applying best environmental practices within schools. By understanding the challenges and successes encountered by educators and students, the findings can inform the development of more effective training programs, resource allocation, and policy frameworks that better support environmental initiatives. Additionally, the study's exploration of contextual factors influencing implementation can guide schools in creating tailored strategies that foster student engagement and promote long-term behavioral change. Ultimately, these contributions can help educational institutions cultivate a culture of sustainability, empowering learners to become active participants in addressing environmental issues both locally and globally.

METHODS

Research Design

This study employed a qualitative narrative research design to explore and understand the personal experiences of educators as they implemented effective environmental practices in their schools. This approach was particularly useful because it allowed for the collection of rich, detailed stories that revealed how teachers perceived, interpreted, and navigated the challenges and successes associated with environmental initiatives. By focusing on individual narratives, the research captured the complexities and nuances of real-life experiences, providing deeper insights into the processes and

factors that influenced the adoption and sustainability of best practices. This method also enabled the voices of teachers to be heard directly, highlighting their perspectives and reflections in a way that quantitative methods might have overlooked. The duration of the study spanned ten months, from March 2025 to October 2025. This period included refining the proposal paper, participant recruitment, and data collection, one month for data analysis, and one month for reporting and dissemination of findings.

Participants

The study involved 17 YES-O advisers from various small and large schools within the Municipality of Isulan to gain a comprehensive understanding of their experiences in applying effective environmental practices. Of these participants, 10 were selected for in-depth interviews to provide detailed, personal accounts, while the remaining 7 participated in focus group discussions to encourage shared reflections and collective insights. This combination of individual and group data collection methods captured both the unique and common experiences of YES-O advisers across different school sizes.

Participants were chosen based on their active involvement in planning and leading environmental initiatives within their respective schools. Only those who were currently serving as YES-O advisers and willing to participate in either interviews or focus group discussions were included. Those who had little to no engagement with environmental activities or were unable to commit due to scheduling conflicts or other personal reasons were excluded. This selection process ensured that the data collected was relevant and meaningful to the study's focus on successful school-based environmental practices.

Data Collections Tools

The study used semi-structured interview guides and document reviews as the main data collection tools. The interview guide consisted of open-ended questions designed to capture the experiences of school leaders and teachers in implementing environmental practices. Additionally, relevant documents such as school reports, activity records, and photographs of environmental projects were reviewed to support and validate the data gathered from the interviews. This combination of methods allowed for a more comprehensive understanding of the practices and experiences of participants.

Procedures

The study began with securing approval from the adviser and the College of Management and Development (CMD) graduate school. Following this, permission was obtained from the DepEd supervisor and school principals to conduct the study within selected schools. Subsequently, informed consent was secured from the YES-O advisers who were chosen as participants due to their active roles in planning and implementing environmental initiatives. Schools with established environmental programs were identified, and interviews were conducted specifically with the YES-O advisers, as they directly oversaw and managed these initiatives. All interviews were scheduled at a convenient time for participants, recorded with their consent, and transcribed for analysis. Supporting documents, including activity reports, photographs, and project summaries, were also collected to provide context and validate the success stories shared by the YES-O advisers.

Data Analysis

Data were analyzed using thematic analysis guided by the six-step approach proposed by Braun and Clarke (2006), complemented by Colaizzi's (1978) phenomenological method to ensure the richness and validity of participants' experiences. Interview transcripts and supporting documents were carefully read multiple times to achieve immersion in the data. Significant statements related to successful environmental practices, implementation strategies, and sustainability efforts were extracted, and preliminary codes were generated. These codes were then grouped into meaningful categories, and recurring patterns were identified to form overarching themes. The thematic framework was continually refined through a process of comparison, validation, and interpretation to capture the essence of participants' experiences. Colaizzi's method was employed to systematically validate the findings, ensuring that the themes accurately reflected the perspectives of the YES-O advisers. This combined approach allowed for a comprehensive and rigorous understanding of the factors that contributed to successful environmental programs and the sustainability of greening education practices in different schools.

RESULTS AND DISCUSSION

Teachers' Experiences in Implementing Best Environmental Practices

The study examined how teachers experience the implementation of best environmental practices in their schools. Based on the data, the following themes emerged: teacher leadership and modeling environmental responsibility, creativity and resourcefulness in addressing implementation challenges, and the importance of consistency and student engagement.

Table 1. Teachers' Experiences in Implementing Best Environmental Practices

Issues Probe	Codes / Category	Significant Statements	Themes	Meanings
Teacher role in practice	Modeling behavior; Leading by example; Ripple effect	turn off lights; segregate waste; students copy actions	Teacher leadership and modeling environmental responsibility	Teachers' actions shape environmental norms
Addressing limitations	Improvisation; Material reuse; Lesson integration	reuse bottles; labeled boxes; art from waste	Creativity and resourcefulness in addressing implementation challenges	Resource limits encourage creative solutions
Sustaining practices	Routine building; Student ownership; Peer leadership	daily segregation; student leaders; peer reminders	Importance of consistency and student engagement	Consistency and engagement build lasting habits

Theme 1: Teacher leadership and modeling environmental responsibility. The first theme that emerged from the results highlights the central role of teachers as leaders in cultivating environmental responsibility within the school community.

Participants shared that their personal actions served as visible examples that students naturally follow, demonstrating how leadership is expressed not only through instruction but through lived environmental behaviors embedded in daily routines. Teachers noted that environmental practices became influential when they themselves modeled them consistently—showing students how to segregate waste, conserve energy, maintain clean spaces, and participate in green initiatives. Over time, this modeling shaped a culture where environmental consciousness became a shared expectation rather than a mandated rule. Many participants emphasized that teacher-led actions initiated a ripple effect, influencing students, colleagues, and even families to participate more actively in sustainability efforts, which reflects how leadership deeply shapes school-wide practices.

> *"I always make it a point to turn off the lights and fans before leaving the room. After some weeks, students started doing it ahead of me, telling me they learned it from watching what I do every day." (IDI, P1)*
>
> *"As a class adviser, I started segregating waste myself—slowly my students began copying the system until it became our daily routine." (IDI, P3)*
>
> *"One student said, 'Sir, I saw you picking up trash even when it wasn't your class area, so now I do it too because it feels good to help the school.' That moment showed me how powerful modeling can be." (FGD, P2)*
>
> *"My students often tell their parents about what they see us doing in school. One parent shared that their child now supervises waste segregation at home because of the habits they saw me practice." (IDI, P6)*
>
> *"When teachers show genuine action, students feel inspired. Some even remind their classmates, saying, 'Our teacher always recycles, so we should too.' It really becomes part of their mindset." (FGD, P5)*

Research has shown that responsible leadership in school environments plays a significant role in influencing pro-environmental behavior among teachers and students, particularly when leaders model consistent and meaningful actions that reflect environmental values (Wang, Kou & Zhu, 2023). This aligns with the study's results, which demonstrate that teacher-led modeling strengthens commitment to sustainability and helps establish environmental norms within the school setting. Additional studies in environmental education emphasize that teacher leadership shapes children's ecological awareness through consistent modeling of environmentally responsible behaviors. When learners observe their teachers practicing sustainable habits, they internalize these actions as part of their everyday culture, strengthening the school's environmental identity (Meika & Putra, 2021).

Theme 2: Creativity and resourcefulness in addressing implementation challenges. The second theme revealed that teachers frequently relied on creativity and resourcefulness to sustain environmental initiatives despite material shortages, limited funding, and infrastructural constraints. Many educators described adapting available materials—reusing plastic bottles, repurposing cartons, or creating makeshift segregation bins—to ensure that environmental practices continued even without ideal resources. Teachers incorporated environmental activities into regular lessons, combined routine tasks with sustainability reminders, and developed student-led initiatives that required minimal cost. This flexibility demonstrated their ability to transform limitations into opportunities for learning, creating meaningful environmental experiences from simple and accessible materials. Such efforts not only addressed practical challenges but also fostered innovation among students, who became more involved in designing and sustaining environmentally friendly projects.

> *"In our classroom, we used leftover plastic bottles as plant containers for our mini-garden. The students decorated them, and it became a project they proudly maintained." (IDI, P2)*

> *"When our school lacked proper bins, we made our own by labeling old boxes and placing them strategically around the campus. Students were excited to use them because they helped create them." (FGD, P1)*

> *"We did not have enough funds for an Earth Day activity, so my class suggested using recyclable items from home. They brought plastic, paper, and metal scraps, and we turned them into environmental displays." (IDI, P5)*

> *"I added short environmental reminders at the end of each lesson. It required no budget, but over time, students began suggesting ideas on how to reduce waste in the classroom." (IDI, P8)*

> *"Our students even initiated an art project using old magazines and cardboard. It became a hallway exhibition that encouraged other classes to join in recycling efforts." (FGD, P4)*

Research highlights that creativity and adaptability are essential components of effective environmental education, particularly in schools with limited resources. Creative pedagogical practices—such as repurposing materials and designing context-based solutions—allow teachers to sustain environmental learning even when faced with financial or logistical barriers (Govorova et al., 2025). These findings support the idea that resourceful practices are foundational in strengthening environmental culture in schools. Furthermore, studies show that active, creative, and collaborative approaches significantly enhance environmental literacy. When teachers use imaginative strategies, students develop deeper engagement and a stronger personal connection to

sustainability, demonstrating that resourcefulness can equal or surpass the impact of well-funded programs (Zhang, Jung & Asari, 2025).

Theme 3: Importance of consistency and student engagement. The third theme reflects the importance of maintaining consistency in environmental practices and fostering student engagement to ensure long-term change. Participants emphasized that environmental behavior becomes meaningful only when practiced regularly rather than through isolated events. Daily routines such as recycling, energy-saving practices, waste monitoring, and weekly clean-ups were seen as vital in shaping habits that students embraced naturally. Another core point raised by participants was the central role of student involvement—when learners take ownership of environmental tasks, they become active contributors rather than passive followers. Students reminded their peers to follow procedures, led recycling groups, formed environmental clubs, and even applied practices at home. Teachers saw these moments as indicators that consistency and involvement were helping to build a school culture where sustainability was practiced, shared, and valued.

> *"In the first months, I had to remind everyone to segregate. After some time, students would rush to organize the bins themselves before I even mentioned it." (IDI, P1)*
>
> *"We have a weekly garden clean-up, and students look forward to it. Some even asked if they could have an extra day for watering the plants." (FGD, P2)*
>
> *"A group of students created their own recycling roster—they assigned weekly leaders who would check that recyclables were properly sorted." (IDI, P4)*
>
> *"My students began reminding each other to switch off lights and fans. They told me they even practiced it at home because it became part of their routine." (FGD, P5)*
>
> *"During discussions, many students shared creative ideas to reduce waste. Their active involvement showed that these habits were becoming personally meaningful to them." (IDI, P9)*

Research findings indicate that consistent and routine-based environmental practices significantly improve students' environmental literacy and long-term commitment to sustainability. Sustained exposure to environmental tasks helps normalize pro-environmental behaviors and supports the internalization of sustainable habits across school communities (Ernst et al., 2020). This supports the theme by highlighting how routine and repetition shape behavior more effectively than occasional activities. Additional studies emphasize that student engagement and participatory roles—such as leading school-based environmental initiatives—promote stronger identity formation around sustainability. When students actively contribute to environmental projects, they

gain a sense of ownership that strengthens their motivation and long-term environmental behavior (Goralnik & Nelson, 2024).

Factors Influencing Effectiveness of Environmental Practices

The study explored the factors that affect the effectiveness of environmental practice implementation in schools. Based on the data, the following themes emerged: resource dependency and adaptive strategies, community collaboration and parental engagement, and leadership commitment and supportive school policies.

Table 2. Factors Influencing Effectiveness of Environmental Practices

Issues Probe	Codes / Category	Significant Statements	Themes	Meanings
Resource availability	Improvisation; Reuse materials; Low-cost strategies	make own bins; reuse materials; student drives	Resource dependency and adaptive strategies	Effectiveness relies on adaptive use of limited resources
Home–school support	Parental help; Community participation; Shared responsibility	parents send recyclables; community clean-up; home practice	Community collaboration and parental engagement	Community involvement strengthens sustainability
Administrative support	Policy integration; Leadership backing; Institutionalization	school recycling policy; approved budget; school-wide rules	Leadership commitment and supportive school policies	Leadership support ensures continuity and impact

Theme 1: Resource dependency and adaptive strategies. Based on the participants' accounts, one major factor influencing success of environmental practices was the availability (or lack) of physical resources, which often constrains standard "ideal" implementation — but many teachers responded by developing adaptive strategies to work around these limitations. When bins, recycling containers, or budget for project materials were lacking, teachers described improvising with available resources — repurposing old containers, reusing materials, or organizing student-led collection drives using household recyclables. This resource dependency meant that environmental practices could not always follow a "textbook" plan; rather, their effectiveness depended on how creatively and flexibly teachers adapted to constraints. The adaptive strategies became part of what made the environmental initiatives not just possible, but sustainable over time, because they adjusted to real-world conditions rather than relying on ideal resource availability.

> *"I asked students to bring old plastic bottles and cardboard boxes from home — we turned them into recycling bins because the school lacked enough official trash containers." (IDI, P2)*

> *"When funds for a compost project were unavailable, we arranged for families to contribute kitchen scraps — and we used an old barrel for composting." (FGD, P4)*

> *"We didn't have special recycling bins, so I painted and labeled used boxes and placed them near classrooms for paper recycling." (IDI, P6)*

> *"I organized a student-led drive: every Friday kids bring clean waste from home — plastic, paper — and we collect and sort them for recycling." (FGD, P7)*

> *"When we don't have budget for environmental posters or educational materials, I encourage students to draw and produce them themselves using reused paper and cartons." (IDI, P9)*

In support, studies on "whole-school" environmental education emphasize that resource constraints are common, and effective programs often rely on adaptive, context-sensitive strategies — utilizing existing materials, engaging learners in resource management, and adopting low-cost but meaningful practices to sustain environmental learning (Joongpan & Putwattana, 2019). Such flexibility helps schools maintain environmental activities even under budget or infrastructure limitations without compromising engagement or outcomes. Furthermore, organizational studies suggest that environmental management in schools is positively correlated with strategic leadership and the ability to adapt to changing resource conditions; when school staff creatively mobilize resources — human, material, community — this adaptability strengthens environmental management capacity and helps overcome limitations common in under-resourced settings (Khamwan & Silanookit, 2025).

Theme 2: Community collaboration and parental engagement. Another critical theme identified is the role of community and parental involvement: participants often pointed out that when environmental practices extended beyond the school — involving parents, families, and broader community — their effectiveness and sustainability increased substantially. Teachers reported that cooperation from families (e.g., sending recyclable materials from home, supporting waste-collection drives) and broader community understanding and buy-in helped not only supply necessary materials but also reinforced environmental values outside the school context. This collaboration bridged the school environment with students' home lives, creating a supportive ecosystem that enhanced the impact of school-based environmental efforts. As a result, environmental practices became more integrated, and their benefits extended beyond the school grounds.

> *"Some parents started sending clean recyclables from home — plastic bottles, paper — once they knew we were running a recycling program." (FGD, P1)*

> *"We organized a neighborhood clean-up day; parents, older siblings, and neighbors joined along with students — it strengthened everyone's commitment." (IDI, P4)*

"Families told me their children now remind them to separate trash at home — the school's program inspired changes beyond our classroom." (FGD, P3)

"Our school collaborated with local waste-collection volunteers; they helped us collect sorted materials from students' homes every month." (IDI, P7)

"During a school community meeting, parents proudly shared how their children taught them to save water and recycle — that warmed my heart." (FGD, P6)

Research on environmental education supports that when schools engage parents and community stakeholders in sustainability programs, this collaboration significantly enhances educational and behavioral outcomes. For example, community-involved environmental initiatives foster a sense of collective responsibility and extend environmental values beyond school, reinforcing students' behaviors at home and in their neighborhoods (Kaewkumkong, 2022). Moreover, inclusion of parents and community in eco-school frameworks contributes to more sustainable environmental management because it broadens resource pools (materials, labor, knowledge) and strengthens social support networks — creating a community ecosystem that sustains what is initiated in school (Community Engagement in Rural School Management, 2023).

Theme 3: Leadership commitment and supportive school policies. A third theme that emerged is the influence of leadership commitment and supportive institutional policies on the effectiveness of environmental practices. Multiple teachers underscored that when school administrators and decision-makers were supportive — providing permission, scheduling time for environmental activities, integrating green practices into school regulations — the initiatives had greater structure and continuity. Leadership commitment translated into a stable environment for environmental practices to flourish: formal adoption of recycling policies, institutional support for composting or waste management, and official recognition of environmental activities. This structural backing reduced dependence on individual teachers' discretionary effort and helped ensure sustainability beyond individual enthusiasm.

"I proposed a recycling schedule and asked the principal if we could include it in weekly school routine — and she agreed, so now recycling is part of school policy." (IDI, P2)

"The school management approved budget for green activities, even if small — that made a big difference." (FGD, P4)

"Once the administration officially supported our waste-segregation project, other teachers joined in more willingly." (IDI, P6)

> *"The principal announced monthly environmental-awareness days; that formal backing made students and teachers take it seriously." (FGD, P5)*

> *"Now we have a school regulation: after class, everyone must check lights and fans — it's not just my class anymore, it applies school-wide." (IDI, P10)*

In support, recent findings indicate that strategic leadership from school administrators is strongly associated with effective environmental management in schools — when leaders prioritize environmental initiatives, provide structural support, and integrate green practices into school governance, eco-school programs are more likely to succeed and sustain over time (Khamwan & Silanookit, 2025). Additionally, theory on education for sustainable development argues that embedding environmental management within school policy and governance — rather than treating it as an add-on — is essential for long-term sustainability: when environmental values become part of institutional norms, initiatives transcend individual teachers' efforts and become part of school identity (Bamrungsetthapong, 2022).

Insights Gained Regarding Environmental Awareness and Sustainability

The study investigated the insights teachers gained regarding environmental awareness and sustainability through their implementation experiences. Based on the data, the following themes emerged: shifting mindsets and integration of environmental values, student empowerment and developing environmental stewardship, and practical and collaborative approaches for sustaining practices.

Table 3. Insights Gained Regarding Environmental Awareness and Sustainability

Issues Probe	Codes / Category	Significant Statements	Themes	Meanings
Mindset change	Value integration; Routine practice; Cultural shift	*daily responsibility*; *normal practice*; *embedded values*	Shifting mindsets and integration of environmental values	Sustainability becomes shared norm
Student involvement	Student leadership; Ownership; Decision-making	*student-led recycling*; *peer reminders*; *student clubs*	Student empowerment and developing environmental stewardship	Empowerment builds stewardship
Sustainable practice	Practical strategies; Collaboration; Shared roles	*simple activities*; *team monitoring*; *joint projects*	Practical and collaborative approaches for sustaining practices	Collaboration sustains practices

Theme 1: Shifting mindsets and integration of environmental values. The first theme that emerged is the shift in teachers' and students' mindsets toward environmental responsibility and the integration of these values into daily life. Many participants believed

that environmental practices were no longer extra tasks but essential components of education and life skills. Teachers noted that repeated exposure to environmental activities and modeling of responsible behavior led them to perceive environmental stewardship as a shared value rather than a peripheral project. Over time, students internalized these values, and both teachers and learners began to view sustainability as part of the school's culture. The results show that integrating environmental values into routines and decision-making nurtures a lasting shift in thinking, promoting a holistic understanding of sustainability within the school community.

> *"I realized that small actions, like turning off unused lights, were part of something bigger — and I started treating it as a daily responsibility rather than a suggestion." (IDI, P1)*
>
> *"Students now talk about saving water and recycling as if it's a normal part of school life — they no longer see it as extra work." (FGD, P2)*
>
> *"After months of consistent practices, my mindset changed: environmental awareness is part of teaching, not just an activity for Earth Day." (IDI, P4)*
>
> *"One teacher said, 'We now plan lessons considering environmental impact, like using digital materials to reduce paper waste.'" (FGD, P6)*
>
> *"Students began discussing environmental solutions themselves — they suggest ways to conserve energy and reduce waste without prompting." (IDI, P9)*

In support, Ernst and Monroe (2020) emphasize that repeated engagement in environmental activities cultivates deeper understanding and internalization of sustainability values among both teachers and students. Their study demonstrates that when environmental practices are integrated into daily routines rather than treated as supplementary activities, participants develop a stronger sense of environmental responsibility that influences both attitudes and behaviors. This aligns with the current study's findings, where teachers observed a gradual but profound shift in mindsets, with sustainability becoming an embedded value rather than an external task. The literature further explains that such cognitive and behavioral changes are reinforced when participants can observe the outcomes of their actions, which strengthens the perception that environmental responsibility is meaningful and achievable.

Further, Liu and Zhou (2022) argue that integrating environmental values into school culture contributes not only to individual behavioral change but also to the development of a collective sustainability mindset. Their research supports the result of this study by showing that when teachers and students perceive environmental care as a shared norm, they are more likely to make consistent choices aligned with sustainability goals. Moreover, embedding environmental practices in everyday routines creates an opportunity for reflection, dialogue, and reinforcement, which deepens understanding and

ensures that environmental values are carried beyond the classroom into broader life contexts.

Theme 2: Student empowerment and developing environmental stewardship. The second theme emphasizes that student involvement and empowerment are crucial in fostering environmental stewardship. Teachers observed that when students actively participate in environmental projects — such as recycling, gardening, and clean-up initiatives — they take ownership of their actions and develop a sense of responsibility for their environment. Many participants believed that involving students in planning and decision-making strengthens engagement and encourages independent problem-solving. The results highlight that empowerment of students does not merely reinforce practices but cultivates future environmentally conscious citizens who understand the impact of their actions both in school and beyond.

> *"Students now lead the recycling project in our classroom — they decide when to collect, sort, and manage materials." (IDI, P2)*
>
> *"One grade-six student reminded classmates to turn off fans and lights without being asked, showing that leadership can come from anyone." (FGD, P3)*
>
> *"Students suggest ideas for waste reduction during meetings — they feel proud that their voice matters." (IDI, P6)*
>
> *"During our school garden project, students decided which plants to grow and how to maintain them; they took full responsibility." (FGD, P5)*
>
> *"Some students started environmental clubs, mentoring younger students on recycling and energy conservation." (IDI, P9)*

In support, Kaewkumkong (2021) highlights that empowering students in environmental initiatives fosters ownership and enhances pro-environmental behaviors. Their study demonstrates that students who are actively involved in decision-making and leadership roles in sustainability projects develop stronger personal commitment and accountability. This supports the current study's findings, where student engagement in projects such as recycling or gardening encouraged independent thinking, problem-solving, and leadership. The literature also notes that empowerment provides opportunities for learners to link theoretical knowledge with practical applications, making environmental education more meaningful and long-lasting.

Additionally, Zhang (2022) explains that student-led initiatives and participatory programs cultivate environmental stewardship by promoting collaboration, responsibility, and leadership. The study supports the findings of this research by showing that students engaged in planning, organizing, and executing sustainability projects develop habits and attitudes that extend beyond school boundaries. These practices also help students influence their peers and families, reinforcing a broader environmental impact. Zhang

emphasizes that the combination of active participation and structured guidance from teachers maximizes learning outcomes and creates a sustainable school culture oriented toward environmental care.

Theme 3: Practical and collaborative approaches for sustaining practices. The third theme highlights that practical strategies and collaboration among teachers, students, and the community support sustainability of environmental practices. Teachers indicated that structured, achievable activities and teamwork promote consistent implementation and maintain momentum over time. By combining practical solutions (like using recycled materials) with collaborative efforts (student committees, teacher partnerships, and parental support), environmental initiatives became more manageable and impactful. Participants noted that such collaboration not only ensured continuity of programs but also created a shared sense of responsibility and ownership across the school. The results suggest that when practical strategies are embedded within collaborative structures, they increase both engagement and sustainability of environmental efforts.

> *"We plan activities that are simple but meaningful, like using recycled bottles for planting, which students can easily maintain." (IDI, P4)*
>
> *"Teachers work together to monitor energy use, ensuring classrooms follow agreed-upon routines." (FGD, P2)*
>
> *"Students collaborate on clean-up drives; they assign roles and check each other's progress." (FGD, P6)*
>
> *"Parents help by sending recyclables or supervising community clean-up, so school efforts extend beyond the campus." (IDI, P7)*
>
> *"During joint projects, students, teachers, and staff discuss improvements and rotate responsibilities, making sure tasks are completed efficiently." (IDI, P10)*

In support, Goralnik and Nelson (2021) argue that collaborative approaches in environmental education are critical for sustaining school initiatives. Their research demonstrates that when teachers, students, and community members work together, there is greater engagement, shared accountability, and continuity of programs. This supports the study's findings, showing that collaboration allows schools to overcome resource and knowledge limitations while maintaining consistent environmental practices. Furthermore, collaborative strategies enhance problem-solving and leadership skills among students and teachers, strengthening the overall culture of sustainability.

Moreover, Safitri et al. (2022) emphasize that practical, achievable environmental practices are most effective when embedded in collaborative frameworks that include all stakeholders. Their research indicates that combining simple, manageable activities with structured teamwork increases sustainability, ensures broader participation, and

facilitates knowledge transfer between teachers, students, and parents. This aligns with the study's results, where joint planning and cooperative activities promoted long-term engagement, consistency, and shared ownership of environmental responsibilities.

CONCLUSIONS

1. Teachers' leadership and modeling of environmental responsibility significantly influence students' attitudes and behaviors. When teachers consistently demonstrate sustainable practices, they serve as role models, reinforcing environmental habits and norms in both classroom and school-wide contexts. This implies that professional development programs should equip teachers not only with technical knowledge of environmental practices but also with strategies to lead by example, fostering a culture of sustainability through consistent action.
2. Creativity and resourcefulness are crucial in addressing implementation challenges. The findings suggest that teachers who adapt available materials, innovate low-cost strategies, and integrate environmental practices into existing routines can overcome resource limitations effectively. This highlights the need for schools to support flexible approaches, encouraging teachers to design context-specific initiatives that make sustainability achievable regardless of infrastructure or funding constraints.
3. Consistency, student engagement, and collaborative participation are key to sustaining environmental practices. Teachers reported that environmental initiatives gain longevity when students are actively involved and when daily routines reinforce sustainability behaviors. This implies that school programs should emphasize participatory learning, routine environmental activities, and strategies that empower students to take ownership of projects, ensuring the integration of sustainability into the school culture.

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