

Voices of Teachers on Waste Disposal Management in Valentin N. Daquio Elementary School: Basis for Cleaner School Improvement

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ABSTRACT

This qualitative study explores the experiences of teachers with waste disposal practices at Valentin N. Daquio Elementary School in Panabo City. It aims to understand the challenges they face, the improvements they propose, and their perceived roles in promoting effective waste management. Using purposive sampling, five primary school teachers with more than three years of classroom waste management experience were selected. Data were collected through in-depth interviews and analyzed thematically. The findings revealed several key challenges including improper waste management, poor student retention, weak waste management system, waste management malpractices, inconsistent student compliance, and weak community collaboration. These issues stemmed from student behavior, lack of home support, limited school facilities, and insufficient coordination with the barangay. Teachers suggested improvements like an expanded waste management system, strengthened waste education responsibilities, language-aided waste segregation, and supported waste management initiatives. These included expanding the Materials Recovery Facility (MRF), adding labeled trash bins, and involving experts and student organizations in environmental training. In terms of their role, teachers emphasized the importance of leading by example, integrating waste education, enforcing classroom rules, and providing constant reminders. They believe their actions influence student habits and are essential in shaping a cleaner and more responsible school environment. The study aims to highlight teachers' lived experiences and insights so that their challenges and suggestions can inform practical, school-based solutions for improved waste management. By understanding their day-to-day encounters, the study seeks to support the development of waste management policies grounded in the realities of the classroom.

Keywords: Waste Disposal Management; Environmental Education; School-based Programs; Elementary Teachers; Qualitative Research, Philippines

INTRODUCTION

Educational institutions frequently face challenges related to inadequate waste segregation, insufficient disposal facilities, and poor student discipline in trash management. Malaya and Pasion (2020) highlight operational challenges to proper waste disposal, such as the lack of garbage containers and ineffective collection systems. Internationally, low awareness and participation among elementary teachers in waste disposal programs persist. For instance, a 2019–2020 study in Turkey revealed many teachers were unaware of the national Zero Waste Project, emphasizing the need to integrate environmental education across subjects (Yüzüak & Erten, 2022). In the Philippines, Anao-Kiling Elementary School struggles with consistently implementing waste policies despite high awareness, primarily due to high waste volumes and inadequate infrastructure (Espiritu, 2024). Moreover, teachers identified a lack of practical training as a barrier to fostering sustainable habits and environmental consciousness (Mugabi & Muwanguzi, 2015).

Waste disposal management in educational institutions is essential for fostering sustainable development, as education plays a vital role in raising awareness and cultivating responsible societal behaviors (Haniva et al.,

2024). Schools produce a wide variety of waste, including food scraps, paper, plastics, and electronic devices. Efficient waste management reduces a school's environmental impact and sets an example of sustainable living for students (ACTenviro, 2024). A conducive school environment is essential for effective teaching, and maintaining hygiene, safety, and cleanliness in school premises, classrooms, and support areas is crucial (Njau et al., 2024).

Waste segregation, a key component of waste management, involves sorting waste by material type, often using color-coded bins. This practice encourages a cleaner environment, promotes recycling, and improves overall waste management (Erhabor, 2023). Education on sustainable waste management goes beyond practical skills; it fosters critical thinking, inquiry, and innovative solutions to complex waste-related problems (Sustainability Directory, 2025).

Globally, approximately 2.01 billion tons of solid waste are generated yearly, with 33% not correctly disposed of and only 20% recycled or composted (World Bank, 2020). In 2018, the Philippines produced 16.6 million tons of solid waste, making it the third-largest producer in Southeast Asia (Romero, 2020). The country's solid waste output continues to increase, primarily due to weak law enforcement, a lack of sanitary landfills, and improper disposal practices (Coracero et al., 2021). Republic Act No. 9003, or the Ecological Solid Waste Management Act of 2000, mandates barangays to segregate and collect biodegradable waste, while cities and municipalities handle non-recyclable and special wastes.

The Philippines faces significant environmental challenges, with solid waste management (SWM) among its most pressing issues (Baclig, 2024). These challenges pose public health risks, including the spread of infectious and respiratory diseases. Despite the legal framework established by The Ecological Solid Waste Management Act of 2000 (RA 9003), implementation remains weak due to limited public awareness and inconsistent waste segregation practices, particularly in coastal and urban communities (DENR, 2024).

Beyond policy and infrastructure behavioral issues persist. Students or teachers sometimes fail to use designated bins or segregate waste properly, reflecting a lack of discipline and awareness of the consequences (Nerida et al., 2025). According to Agarwal (2021), schools generate specific amounts of waste due to large populations (students, instructors, staff) and daily operations (canteens, classrooms, offices). Paper and plastics make up the majority of school waste streams. Debrah et al. (2021) found that many schools, particularly in developing countries, lack adequate infrastructure, trained staff, and access to recycling technologies.

United Nations Environment Programme (2021) also notes that limited educational resources—such as teaching materials and textbooks—negatively affect quality education and hinder the integration of ecological practices into the curriculum. Similarly, Bulut (2020) found that preschool teachers reported low environmental awareness among children and suggested using visual aids and interactive methods to improve learning. In the Philippines, several studies indicate that while awareness of solid waste management is high among students and teachers, this awareness often does not lead to consistent behavioral change (Balubal et al., 2023).

Elementary teachers in the Philippines struggle to implement effective waste management practices due to limited resources, lack of training, and minimal institutional support (Patchen et al., 2022). Despite these constraints, teachers remain committed to fostering environmental responsibility among students. However, few studies have explored teachers' specific challenges or how they incorporate waste management education into their classroom instruction (Parry & Metzger, 2023). These struggles emphasize the necessity of comprehensive teacher training programs, enhanced waste management infrastructure, and greater curricular integration of environmental consciousness (Valdepeñas, 2023).

Promoting sustainable waste management practices in schools benefits the entire community by creating a safer, cleaner environment, instilling environmental values early, and fostering a culture of sustainability. Still, questions remain: Do students know how to dispose of waste properly? Does the school provide enough trash

bins? Issues with school waste management often stem from student habits and lack of cooperation, and successful implementation requires active participation from all stakeholders (Nabor, 2022).

Bronfenbrenner's Ecological Systems Theory (1979) and Ajzen's Theory of Planned Behavior (1991) provide solid theoretical frameworks for understanding and improving waste management practices. Bronfenbrenner emphasizes how larger systemic factors, such as institutional policies, shape microsystem-level actors like teachers. Based on Ajzen's theory, behavior is also influenced by attitudes, perceived control, and social norms. These theories underscore the need for systemic, collaborative approaches in empowering teachers to model and teach sustainable behaviors.

This study seeks to amplify the often-overlooked voices of teachers regarding waste management and to inform evidence-based, context-specific solutions. Teachers are essential to shaping student attitudes and habits, yet their perspectives are underrepresented in research (Garcia et al., 2023). The 3R concept—Reduce, Reuse, Recycle is central to effective waste disposal, and educating students about these principles is key to minimizing environmental harm (Naria et al., 2018).

Although broad environmental policies exist, little attention is paid to how these are implemented in schools or integrated into daily classroom practices (Alhassan & Amoako, 2020). Studies exploring how elementary teachers incorporate waste education into their lessons and the barriers they encounter are scarce but essential (Joyce & Cartwright, 2019). Understanding these dynamics will help guide teacher empowerment and school-based sustainability initiatives. Teachers are crucial in shaping the lifelong habits of students, which often extend to their homes and communities (Ardoine, Bowers, & Gaillard, 2019).

At Valentin N. Daquio Elementary School in Panabo City, teachers have taken initiative by conducting recycling activities and integrating waste education into their teaching. They believe that instilling values of environmental stewardship from a young age fosters lasting behavioral change (Sprague et al., 2021). Teachers also help students create a cleaner, more sustainable environment by modeling waste reduction, promoting recyclable objects, and involving students in sustainability projects (Pires et al., 2019).

This study contributes to existing literature by centering teachers' lived experiences and insights. By exploring their challenges and strategies, this research informs more inclusive and practical school-based sustainability efforts (Godfrey, 2021). It also explores how teachers integrate waste management into lessons and identifies actionable solutions for enhancing educational outcomes and environmental responsibility (Davis & Miller, 2023). Future research could consider teachers with varying experience levels and explore additional approaches to studying the impact of waste management on educators.

The findings of this study illustrate both the opportunity for improving current waste management practices through teacher-led initiatives and the constraints teachers face, such as poor infrastructure, weak institutional support, and limited resources. These findings support previous research emphasizing the vital relevance of incorporating teachers in creating localized, context-specific solutions for waste management (Alhassan & Amoako, 2020). Furthermore, the analysis indicates that administrators prioritize ongoing professional development and ensure institutional policies reflect educators' lived experiences. This strategy will provide educators with the knowledge and resources to encourage sustainable behavior (Thang & Ngu, 2021). The findings also encourage incorporating environmental education and solid waste management into the formal school curriculum and establishing teacher-led initiatives to cultivate an environmental responsibility culture among students (Garcia et al., 2023).

This study has significant academic and social implications since it promotes sustainable development through education. It argues for numerous Sustainable Development Goals (SDGs), including Sustainable Cities and Communities, Quality Education, Responsible Consumption and Production, and Clean Water and Sanitation. This study examines the role of teachers in promoting effective waste management within the school environment, emphasizing educational institutions' ability to serve as catalysts for environmental awareness,

responsible conduct, and community-level sustainability. It also emphasizes the importance of teachers in supporting learning, demonstrating, and promoting environmentally responsible practices.

The importance of this study is to give future researchers an idea of teachers' views on educating students about waste management. The researchers aim to analyze the teachers' experiences, potential solutions, and insights into teaching proper waste management. The researchers also aim to enhance the knowledge of future researchers and, especially, students. This study will be beneficial and serve as a source of data and reference for the following: *BEED students*. This study will raise students' understanding of the experiences they may encounter in the future related to waste management. *Teachers*. This study would benefit teachers' development and improvement in addressing the challenges of teaching waste management at school. *Future Researchers*. This innovation could help future researchers gain additional insights into teachers' views on educating students regarding proper waste management.

The study's objectives encompass the following questions: (1) What challenges do teachers encounter in implementing proper waste disposal practices in Valentin N. Daquio Elementary School? (2) What improvements do teachers suggest to enhance the effectiveness of waste disposal systems in Valentin N. Daquio Elementary School? and (3) How do teachers perceive their role in promoting proper waste disposal in the school?

METHODS

Participants

For this study, the researchers used purposive sampling to select five elementary teachers from Valentin N. Daquio Elementary School in Panabo City, Davao del Norte. These teachers, who faced challenges incorporating waste management into their teaching during the 2024-2025 school year, included one teacher each from Grade 6, Grade 5, Grade 4, Grade 3, and Kindergarten. This sampling method is ideal for qualitative studies as it identifies individuals with relevant knowledge and experience (Etikan et al., 2023) and its sample size aligns with the recommended range for phenomenological studies, which typically include three to ten participants (Creswell, 2013).

To ensure rich, relevant data, the study employed specific inclusion and exclusion criteria for participants: Included teachers were those currently teaching at the school with a minimum of three years' experience, ensuring familiarity with the school's environment and waste management practices. They also needed prior experience integrating waste disposal into their curriculum or participating in school environmental initiatives. Excluded teachers were those with less than three years' experience, no active participation in waste disposal initiatives, or an unwillingness to engage in the study. These criteria guaranteed all participants could offer observations grounded in extensive first-hand knowledge of the school's waste management challenges and processes.

Materials/Instruments

This study used in-depth interviews (IDIs) to gather crucial data from participants. The interview instrument included three broad research questions to capture participants' experiences and potential solutions regarding waste management in their classrooms, supported by fifteen open-ended probing questions to maximize information gathering. The following were the processes utilized by the researchers: (1) Interview: It allowed researchers to explain, better understand, and explore participants' opinions, behaviors, experiences, and related phenomena, proving particularly beneficial for understanding teachers' views on incorporating waste management. Before each interview, prior permission was secured from participants, and researchers ensured all questions were fully understood, providing clarification as needed. (2) Documentation: To establish validity and credibility, researchers documented each one-on-one interview by taking pictures and audio recordings using mobile phones to accurately track conversations and statements. (3) Observation: It also served as a data collection method, with researchers meticulously taking notes on specific instances during participant

interactions. Finally, (4) Thematic Analysis Framework: The analysis employed a thematic framework to conceptually examine the qualitative data. This methodical identification of themes and patterns within the dataset guarantees that the findings are coherent and rooted in the perspectives of the participants (Braun & Clarke, 2021).

Design and Procedure

This qualitative study employed a phenomenological approach to identify shared experiences related to a specific phenomenon. After obtaining informed consent and agreement from participants, researchers scheduled face-to-face interviews at their convenience. Once data was gathered and translated into English, it underwent thematic analysis, a method allowing researchers to closely examine the data for common themes, concepts, and patterns, thereby enabling a clear interpretation of the messages within the texts. The data analysis focused exclusively on relevant statements from respondents, which were then categorized according to established themes.

This study utilizes a qualitative phenomenological research design under the interpretative research paradigm. This design was deliberately selected to investigate and comprehend the lived experiences of elementary educators in incorporating waste management into their classrooms. Phenomenology is particularly effective for examining phenomena that are most comprehensible from the viewpoints of those who have directly encountered them (Creswell, 2013). The researchers wanted to elucidate the significance and essence of participants' issues, tactics, and ideas concerning waste management by concentrating on their narratives and interpretations. Qualitative phenomenology offers an in-depth, contextual comprehension of various human behaviors and social realities. The congruence with the study's purpose of collecting teachers' voices validates the suitability and significance of the phenomenological approach.

The data-gathering process commenced following the acquisition of the necessary authorization from school authorities and the informed consent of all participants. The researchers then scheduled face-to-face, individual interviews with the selected teachers at times and locations convenient to them, ensuring comfort and transparency throughout the discussions. Each interview session lasted approximately 30 to 45 minutes and followed a semi-structured format, guided by the main research questions and relevant probing sub-questions. Interviews were conducted in the local language and later translated into English for analysis. To ensure accuracy, all discussions were audio-recorded with the participants' consent. The collected data were securely stored, transcribed, and analyzed thematically to identify recurring themes and patterns that reflect the participants' lived experiences regarding waste management practices in their classrooms.

To ensure the study's trustworthiness, the researchers adhered to Lincoln and Guba's (1985) criteria: confirmability, credibility, dependability, and transferability. Credibility was established through direct interviews and ensuring participants' experiences aligned with the research focus, while confirmability was demonstrated by transparently explaining the data analysis process to show the results accurately reflected respondent views. Dependability was achieved by verifying findings against raw data, aiming for consistent interpretations, and transferability was supported by providing rich, detailed descriptions of the research context.

Finally, ethical considerations were paramount; an approval letter was secured, informed consent obtained, participants' decisions respected, and data reported honestly. Confidentiality was maintained through anonymization and compliance with the Data Privacy Act of 2012 (RA 10173), safeguarding participant details from unauthorized access and disclosure."

RESULTS AND DISCUSSION

This section presents the research findings in a tabular format, followed by discussions grounded in these findings. The data collected from the informants have been thoroughly analyzed, categorized, and organized into different themes for each piece of information provided.

Table 1. Emerging Themes and Core Ideas on the Challenges Faced by Teachers in Implementing Proper Waste Disposal Practices at Valentin N. Daquio Elementary School

Themes	Core Ideas
Improper Waste Management	<ul style="list-style-type: none"> • The most common issue is students carelessly throwing trash. • Students struggle to segregate waste into the correct bins properly. • Cellophane is identified as the most frequently improperly disposed material by students. • Students throw trash carelessly or anywhere, especially unsupervised or far from trash bins.
Poor Student's Retention	<ul style="list-style-type: none"> • They may initially follow directions but tend to forget them later on. • Despite repeated instructions, some students still throw garbage anywhere. • One-time instructions are not enough; daily reminders and monitoring are necessary to build lasting habits.
Weak Waste Management System	<ul style="list-style-type: none"> • The school's MRF is poorly organized, which contributes to improper waste segregation. • Careless waste disposal persists despite repeated efforts to educate students. • Teachers cannot always supervise students, limiting enforcement of proper practices.
Waste Management Malpractices	<ul style="list-style-type: none"> • Children come from households where waste is not separated, so they have no prior model for segregation. • Because segregation is not practiced at home, students struggle even more to adopt it at school. • Student's behaviour reflects habits learned at home.
Inconsistent Student Compliance	<ul style="list-style-type: none"> • Some students reliably follow instructions from teachers, the principal, or the MRF in charge, but many do not. • Teachers must "double time" and continuously prompt students for the segregation process actually to be followed. • Even when assigned clear roles in waste management, many children remain stubborn, do not listen, and fail to carry out their duties.
Weak Community Collaboration	<ul style="list-style-type: none"> • Although the barangay has monthly garbage collection and encourages segregation, collectors appear insufficiently trained, so mixed-waste issues persist. • Monthly pickups are too sparse and slow, undermining the effectiveness of school and barangay waste-management efforts. • Community initiatives for proper waste disposal is minimal and poorly coordinated with the school, weakening any joint program's overall impact.

Shown in Table 1 are the core ideas and themes generated from the participant's responses to the first objectives which are their Challenges Faced by Teachers in Implementing Proper Waste Disposal Practices at Valentin N. Daquio Elementary School.

Improper Waste Management. Despite the presence of established infrastructure like segregated garbage bins in many schools, the challenge of ensuring that children utilize them correctly persists. Participants frequently highlighted improper garbage disposal as a significant concern, attributing it to students' tendency to carelessly throw away trash and often ignoring the appropriate bin. Despite the provision of waste segregation mechanisms, students often place recyclables in biodegradable containers or leave garbage in regions distant from any trash receptacle.

Based on participant accounts, the issue is not a shortage of resources but rather pupils' habitual behavior. The problem is exacerbated during unstructured periods such as recess when pupils are unattended and garbage cans are less accessible. Cellophane wrappers were regularly identified as the most prevalent litter, demonstrating a consistent trend in garbage mismanagement.

Participant IDI_T1 noted:

"Ah ang common issues namo diri kasagaran sa mga bata man gud nga magpataka ug labay." IDI_T1

(The common issues here mostly involve the children, who carelessly throw their trash anywhere.) IDI_T1

Similarly, IDI_T2 described the struggle of waste segregation in classrooms:

"Sa classroom naa man gud mi tulo ka trash bin usahay dili lang gud nila ma sulod ang basura didto sa sakto nga trash bin kung na rerecyclo murag ma apil siyaa didto sa nabubulok, kinahanglan nasad isegregate murag hasol nasad sa part sa in charge no." IDI_T2

(The classroom has three trash bins, but sometimes the students do not put the trash in the correct bin. For example, recyclables sometimes end up in the biodegradable bin. So the trash needs to be segregated again, which becomes a hassle for the person in charge.) IDI_T2

The issue intensifies during outdoor activities, as expressed by IDI_T4:

"Na dili nimo ma control ang bata kay outside inig mag recess...Pag naa na sila dri sa layu sa mga basurahan ang bata is that...bisag asa naman bilin." IDI_T4

(You cannot control them, especially when they are outside during recess. When they are far from the trash bins, they leave their garbage anywhere.) IDI_T4

These findings highlight that poor waste management is a behavioral issue rather than one of infrastructure. Consistent behavioral reinforcement and monitoring are required to promote reasonable garbage disposal procedures. Research backs up this viewpoint. Yusuf and Fajri (2022) discovered that incorporating waste management programs into campus activities greatly enhanced students' environmental behavior, participation, and understanding, emphasizing the need for institutional support and continual practice. Xu (2025) emphasized the importance of integrating environmental education in schools to foster environmentally responsible attitudes among students and proposed the incorporation of waste management principles into daily curricula and routines.

Moreover, Mkhonto, B. and Mnguni, L. (2021) discovered that initiatives aimed at enhancing environmental awareness, when combined with regular monitoring, significantly reduced littering in Nigerian elementary schools, highlighting the importance of active participation and ongoing assessment. Tendero (2023) discovered that engaging in hands-on activities, implementing peer monitoring, and utilizing visible signs in Philippine schools enhanced students' adherence to garbage segregation, underscoring the significance of active participation and visual cues.

Keller, Sahakian, and Hirt's (2022) comprehensive evaluation concluded that sustainable environmental behavior change requires a diverse approach incorporating education, infrastructure, community engagement, and policy initiatives. To effectively address the issue of illegal garbage disposal, educational institutions should prioritize continuous education alongside the provision of accessible infrastructure. Clear indicators, consistent oversight, and fostering a sense of responsibility are crucial. Engaging parents and the broader community could enhance these initiatives, making effective waste management a societal standard.

Poor Student's Retention. A sustainable school project that promotes environmental stewardship requires consistency and reinforcement. One of the most common problems reported by participants was pupils'

tendency to obey instructions initially but then forget them if they are not reminded frequently. Proper trash management, for example, is difficult to maintain without regular direction, particularly when kids are in less monitored situations such as recess.

Based on participant replies, it was clear that one-time instructions are insufficient to develop long-term behaviors. Children require constant reminders and reinforcement for their behavior to persist. During unstructured moments, such as recess, some children prefer to disregard what they have been taught, demonstrating that beneficial conduct may not last without monitoring and constant practice.

Participant IDI_T2 observed:

“Ang mga bata kung karon nimo isulti sailaha ilang mafollow ang instruction pero later ana malimtan nila mao na siya isa sa challenges. Second, kanang magpataka og labay sa ilang basura.” IDI_T2

(The children, when you tell them now... they follow the instructions, but later on, they forget them. That's one of the challenges. Second, they just throw their trash anywhere.) IDI_T2

Similarly, participant IDI_T4 expressed frustration about student behavior:

“Ang bata bisag kapila nimo storyahon na dili pataka og labay og basura, lagi bisag asa ra gihapon maglabay- labay. Dili nimo ma-control ang bata kay outside inig mag- recess.” IDI_T4

(Even if you keep telling the child not to throw trash just anywhere, they still do it. They throw it wherever they want. You cannot control them, especially when they are outside during recess.) IDI_T4

In addition, participant IDI_T5 emphasized the importance of consistency:

“Dili pwede isa lang ka istorya nimo kay usahay ang tendency sa mga bata kay wala lang. Kaisa lang nimo istoryahan kay dili nimo i-remind every day, dili mapadayon ang project.” IDI_T5

(You cannot just talk to them once because sometimes the children ignore it. If you only tell them once and do not remind them daily to do it, the project might not continue.) IDI_T5

These findings highlight the need for continuous involvement and reinforcement in developing students' long-term environmental behaviors. Evidence supports this approach; for instance, Ismawati et al., (2024) found that incorporating eco-literacy learning models in early education greatly enhanced children's environmental care character, highlighting the importance of ongoing and cooperative efforts among educators and families. In addition, Fayyaz et al., (2023) discovered that schools conducting regular environmental awareness events exhibited improved conservation behaviors among students, highlighting the importance of continuous environmental education in fostering responsible habits.

Rosyadi (2024) discovered that educators' convictions and methodologies in environmental education had a substantial influence on students' environmental behaviors, suggesting that ongoing reinforcement of environmental values is essential in molding students' actions. To ensure the effectiveness of environmental initiatives in schools, it is essential to implement continuous, structured, and cooperative strategies that recognize positive behaviors and engage all parties involved, including educators, students, and the community.

Weak Waste Management System. The success of environmental initiatives in schools relies not just on student behavior but also on the presence of an efficient waste management system. This system incorporates features such as a Materials Recovery Facility (MRF) and designated dumpsters across numerous educational institutions. However, survey participants identified a lack of order and structure in their school's MRF as a key contributor to students' persistent bad disposal habits.

Participant IDI_T2 observed:

"Sa MRF man gud namo dili man gud na ingon na isa. In the school, we have what we call waste management infrastructure." IDI_T2

It may also be because our MRF (Materials Recovery Facility) is not organized into one clear system. In the school, we have a waste management infrastructure.) IDI_T2

Careful disposal remains prevalent despite efforts to discipline and educate students about segregation. As participant IDI_T3 expressed:

"Ang mga bata no magpataka og labay bisag unsaon nimog disiplina og tudlo og proper segregation so magpataka ra gihapon sila og labay." IDI_T3

(The children throw trash carelessly. No matter how much you teach and discipline them about proper segregation, they still throw garbage wherever they want.) IDI_T3

Teachers also shared the limitations of their supervisory role. Enforcing discipline becomes difficult since students are often left unsupervised during recess and other informal settings. As IDI_T4 expressed:

"Miskan pag unsaon nimo ang bata...ayaw jug labay diha...jud mi as teacher nuh kay dili baya mi kuyog-kuyog sa ilaha perminti. So, mao na siya...implementation, ngahhh...gusto unta namo mahitabo nga ang bata... well disciplined." IDI_T4

(No matter how much you remind the children...Do not throw trash there. We, as teachers, are not always with them. So, that is the challenge with implementation. We want the children to be well-disciplined.) IDI_T4

These findings highlight a significant issue: the absence of a well-structured waste management system and uneven monitoring leads to inadequate waste segregation and disposal practices. Research shows that efficient MRFS and systematic waste management are critical for achieving sustainable school waste practices. The Department of Environment and Natural Resources Environmental Management Bureau (2019) states that well-organized Materials Recovery Facility (MRFs) increases waste segregation at the source, lowering contamination and increasing recycling results. Institutions that implement structured waste management systems and assign clear responsibilities demonstrate enhanced environmental outcomes (DENR, 2019).

Moreover, investigations indicate that infrastructure remains inadequate without proactive supervision and engagement. Rakhmadi (2020) highlights that ineffective waste management in schools often stems from deficiencies in enforcement and student oversight, underscoring the necessity for integrated systems that encompass physical facilities, education, and monitoring. Medina's study on solid waste management in Southeast Asian schools indicates that training teachers and student leaders as "environmental champions" enhances compliance and awareness.

Finally, it has been observed that there is an inconsistency in instructor presence during student activities, especially during breaks and outdoor sessions. Ardoin, Bowers, and Gaillard (2019) indicated that schools lacking sufficient supervision experienced elevated littering rates, even with environmental education efforts in place. This underscores the importance of comprehensive strategies that encompass staffing, regular oversight, and community involvement.

Waste Management Malpractices. A significant factor contributing to students' difficulties with proper garbage disposal is the absence of effective environmental practices within their households. Participants noted that numerous children come from households where waste is not sorted, and this absence of proper modeling significantly affects their academic behavior. Children who are not accustomed to separating waste at home tend to be less consistent in doing so at school, even when proper facilities are available.

Participant IDI_T2 shared:

“Sailang balay na naanad sila, sailang balay man gud... wala pud daw naka segregate ang ...waste.” IDI_T2

(Their household is what they are used to... at home, nobody even segregates waste.) IDI_T2

Similarly, IDI_T3 pointed out the difficulty in changing student behavior due to this background:

“Lisod jud sila pasabton kay siguro even siguro sa ilang balay wala na practice ang proper waste disposal so how much more sa eskwelahan.” IDI_T3

(It is hard to make them understand because even in their homes, they do not practice proper waste disposal, especially at school.) IDI_T3

Even when students have basic knowledge about waste segregation, their attitudes often reflect the practices they are exposed to at home. As IDI_T5 observed:

“Attitude sa bata na nakuha guro nila sa ilang balay...kabalo na sila unsa asa dapat na sila ilabay sa biodegradable/non-biodegradable bana sila ...ang tendency sometimes sa mga bata is kanang murag wala lang sa ilaha do bisag kabalo na sila na ingon ana, kanang easy lang sa ilaha ba kung asa lang nila confident ilabay ang basura.” IDI_T5

(The children's attitudes probably come from home... they know which bins are biodegradable or non-biodegradable, but they tend to act like it does not matter. Even though they know they will throw trash wherever they feel comfortable.) IDI_T5

These findings stress how home habits significantly impact environmental behavior in schools. Research backs up this claim. Yulianti et al (2022) discovered that children whose families practice garbage separation at home are more likely to engage in responsible waste management behavior at school. In the Philippines, the Department of Education's Taguig and Pateros (TaPat) division established the "Bantay- Magulang" Garbage Management Project, which assigns children to monitor their parents' compliance with correct garbage disposal methods. This campaign highlights the need for family engagement in instilling environmental responsibility in pupils (Caliwan, 2020). As stated in Dominado et al., (2024), parental awareness and actions significantly impact children's views regarding trash management; engaging and informing parents about correct waste segregation positively influences their children's waste management practices.

Inconsistent Student Compliance. While waste management regulations and responsibilities are well established in many schools, student compliance varies. Students respond positively to directions from instructors, school principals, or designated MRF (Materials Recovery Facility) workers. However, most students ignore these regulations, exhibiting hesitation or resistance to completing their responsibilities. This lack of persistent engagement needs continual effort from teachers, who must constantly remind pupils to follow basic trash segregation procedures.

As IDI_T2 emphasized:

“Oh naay mga studyante na naga follow sa imohang instruction, instruction sa teachers, instruction sa principal or sa incharge samong MRF pero daghan pud ang dili naga sunod so kinahanglan ani nga si teacher mag double time mag kanang mag remind from time-to-time para ma sunod to na processo sa regarding sa waste management.” IDI_T2

(Some students follow your instruction—the teachers, the principals, or the person in charge of our MRF—but many do not. Because of this, teachers have to double their efforts and keep reminding them occasionally to ensure the waste-management process is followed.) IDI_T2

Participant IDI_T3 further described the challenge posed by non-compliant students:

“Naay mga bata na moparticipate pero kasagaran kanang ilang pagkagahi sa ilang ulo nga dili sila maminaw dili sila kabalo mofollow sa mga roles especially sa waste management so magpataka gihapon sila og labay.” IDI_T3

(Some children do participate, but mostly because they are stubborn; they do not listen or know how to fulfill their roles in waste management, so they still throw trash wherever.) IDI_T3

Nevertheless, some students, particularly those in leadership positions, such as YES-O officers, display exemplary behavior. As IDI_T5 noted:

“Ah naa mi mga bata na eager sila na buhaton ang... proper waste disposal labi na sa mga YES-O officer, kabalo sila na dapat kani dapat... ang mahitabo nay mga bata do kabalo sila sa angay buhaton naa pud mga bata na less ang effort nila kung asa convenient ilabay ilang basura, pero kung moingon ka pirme og ang mga bata kay guided.” IDI_T5

(We have children who are eager to do proper waste disposal, especially the YES-O officers; they know exactly what they should do. Nevertheless, others put in less effort and throw their garbage wherever it is most convenient. If you keep reminding them, though, the children stay guided.) IDI_T5

Despite established guidelines, many students are reluctant or resistant to adequate trash segregation techniques. This requires teachers to make constant efforts to recall and guide pupils. For example, research found that while some students follow directions from instructors and school principals, a considerable percentage do not, necessitating that educators increase their efforts to reinforce the waste management process (Taypin et al., 2024).

Student leaders, particularly those involved in organizations such as the Youth for Environment in Schools Organization (YES-O), are significant in promoting sustainable waste management techniques. Their passion and dedication might impact their peers. However, the efficacy of peer-led efforts varies, and constant guidance is necessary to maintain momentum (Pulvera, 2024). Similarly, the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (2021) discovered that peer leadership substantially impacts student behavior in school-based environmental activities.

Integrating environmental education into the school curriculum has been discovered to improve students' awareness and practices around solid waste management. The Department of Education (DepEd) has underlined the need to include environmental subjects in the curriculum to encourage resource conservation and proper waste disposal (Taypin et al., 2024). The Department of Environment and Natural Resources (2024) emphasized the significance of behavioral reinforcement, stating that success in school waste management depends on the appearance of bins and signs and educators' and student leaders' regular habit creation. The DENR has introduced projects that promote youth involvement in solid waste management, such as the Basura Buster mobile gaming app, which is aimed to educate young people on correct garbage segregation through interactive gameplay (Moaje, 2024).

Weak Community Collaboration. Despite current waste management rules and monthly garbage collection schedules, numerous barangays continue to experience issues owing to insufficient training, sporadic collections, and a lack of cooperation with schools. These structural difficulties reduce the effectiveness of local waste management operations.

As IDI_T2 observed:

“Ang ato ang barangay kay ang barangay manay naa gud siyay kana ganing garbage collectors tapos once a month siya tapos gina encourage sad sila nga naa gud waste segregation pero murag sa akong na pansin mura mag mao lang gani gihapon ang mahitabo, sguro wala lang gud sya na train og mga pinoy.” IDI_T2

(In our barangay, garbage collectors come once a month and encourage waste segregation—but from what I have noticed, the same issues keep happening. Maybe they just were not properly trained.) IDI_T2

IDI_T3 highlighted the impact of delayed garbage collection on school activities:

“We practice kanang claygo clean as you go everytime na naa mi mga activities sa school since naa may administration sa barangay na gacollect og basura every month pero mao lagi dugay macollect ang basura. so gina announce namo na syempre na baya canteen no so ang bata every now and then mag sige og palit labi na dili malikayan labi nag naa mi activity so ang ginabuhay sa mga bata nagapalit so pataka lang og labay bisag unsaon nimo og impose ang proper waste management so naa jud mga bata na magpataka og labay og basura, so mao na ginaremind sila na every now and then after sa program ahh you can kana bang e participate nimo or imong buhaton ang claygo policy.” IDI_T3

(We practice a 'clean as you go' policy during school activities since the barangay administration collects garbage monthly. However, the collection is slow. So, we announce reminders, especially at the canteen, yet students keep buying snacks during events and tossing their trash anywhere. No matter how much you enforce proper waste management, some kids throw garbage carelessly. That is why we keep reminding them, after the program, to participate in the clean-as-you-go policy.) IDI_T3

IDI_T5 pointed out the lack of community initiatives and coordination:

“Wala kaayoy project ang community or Barangay when it comes to mga proper waste disposal, murag siguro for me kulangan ko sa ilang effort sa ingon ana na butang kay supposedly kay lung naa silay project dapat mocoordinate sila sa school kay dati kami mocoordinate mi sa ilaha pero kanang less ang effort og walay support na makuha mao ng medyo lisod gyud siya.” IDI_T5

(The community or barangay has no projects for proper waste disposal. Their effort seems lacking because they should coordinate with the school if they had a real program. We used to coordinate with them, but it was difficult, with little effort and no support.) IDI_T5

These findings are corroborated by research by Camarillo and Bellotindos (2021), which examined the compliance of selected barangays in Cebu City with the integrated solid waste management plan. The survey found poor levels of compliance in critical areas such as segregation, composting, recycling, incentives, and public awareness. The authors stressed the significance of effective strategies to increase resident engagement, functioning materials recovery facilities, and easy recycling drop-off locations.

Furthermore, Castillo (2020) found that networked institutions are essential in successful local urban solid waste management. The study discovered that model barangays had evident connections with institutional and non-institutional assistance, and their solid waste management included more than just garbage disposal; it also included network management. To attain better results, the research advised that barangay authorities promote and encourage the development of social organizations and collaborate with them.

Table 2. Emerging Themes and Core Ideas on Teachers' Suggested Improvements for Enhancing Waste Disposal Systems at Valentin N. Daquio Elementary School

Themes	Core Ideas
Expanded Waste Management System	<ul style="list-style-type: none"> • Encourage student projects like bringing sacks for waste collection. • Add more trash bins and assign someone responsible for each area. • We need more trash bins and a larger area for our MRF. • Enlarge the MRF and add more trash bins and sacks. • MRF is too small for school waste; it should be enlarged with more sacks. • Implement a green and clean program for proper waste disposal.

	<ul style="list-style-type: none"> • Training should be given to those in charge in Panabo City with resource speakers on proper waste disposal. • They need orientation seminars like "Tamang Segregasyon: Alamin at Gawain", focused on hands-on waste segregation. • Conduct training and hands-on orientation for students, inviting DENR for expertise. • Invite speakers for teachers and pupils with themes encouraging elementary students to be eco-heroes in small ways.
Strengthen Education Responsibility	<ul style="list-style-type: none"> • Enforce and educate the students and provide additional trash bins. • Promote student responsibility and improve waste disposal by adding trash bins. • Each building should have three types of trash bins to ensure convenient and proper waste disposal for students. • Early orientation is needed to teach students to separate waste properly. • YES-O student group engages elementary pupils in trash picking as early environmental training. • YES-O student organization leads with an adviser, ensuring students' active participation in waste management.
Language Aided Waste Segregation	<ul style="list-style-type: none"> • Trash bins should have labels and pictures to guide proper waste segregation. • Take responsibility by bringing and managing your waste. • Labels in Bisaya, Tagalog, and English with examples help students understand waste segregation. • Clear, large Bisaya labels on the MRF bins help students understand how to dispose of trash properly.
Supported Management Initiatives	<ul style="list-style-type: none"> • Provide trash bins and recognize those excelling in proper waste management with awards. • Lack of trash cans is the problem and needs support from the administration. • The administration should place labeled trash bins in every corner. • The administration should invite speakers and authorities to educate beyond waste management.

Shown in Table 2 are the core ideas and themes generated from the participant's responses to the second objectives which is their Suggested Improvements for Enhancing Waste Disposal Systems at Valentin N. Daquiao Elementary School.

Expanded Waste Management System. Beyond segregation, an Expanded Waste Management System (EWMS) must be implemented in these settings through innovation, education, stakeholder engagement, and behavioral change; participant coded IDI_T1 mentioned:

"...additional namo na factors nga maga project gud ang mga bata og kanang pag dala og sako..." IDI_T1

(...our additional factors are that the children will do projects like bringing sacks...) IDI_T1

Participant-coded IDI_T2 emphasized the need for defined roles and duties in garbage disposal initiatives:

"...dungagan... ang basurahan og kanang kuan pod kanang in charge ba nga murag naka tuka ana... nga area..." IDI_T2

(...add... the trash bins and also like someone in charge who is assigned to that area...) IDI_T2

The limitations of existing facilities, particularly the MRFs, were repeatedly brought up by participants coded IDI_T3, IDI_T4, and IDI_T5:

"...kailangan namog more bins, basurahan ba... kanang mas dako na area pod para sa among MRF." IDI_T3

(...we need more bins, trash bins... like a bigger area for our MRF.) IDI_T3

"... Padak-an ang MRF and also padugang sad og trash bins ug sako." IDI_T4

(...Enlarge the MRF and add more trash bins and sacks.) IDI_T4

"...since naa naman mi MRF maybe dako-dako pa na area kay gamay man gud among MRF... so dili jud enough para sa waste sa school ug more sako...siguro kana padak-an ang among MRF jud." IDI_T5

(...since we already have an MRF, maybe the area should be bigger because our MRF is small... so it is not enough for the school's waste and more sacks...maybe the MRF should be enlarged.) IDI_T5

Participant-coded IDI_T1 highlighted one key program initiative associated with promoting proper disposal:

"...Green and clean program for proper disposal og waste materials." IDI_T1

(...Green and Clean program for properly disposing of waste materials.) IDI_T1

On the other hand, participants coded IDI_T2, IDI_T3, IDI_T4, and IDI_T5 consistently pointed out that training and seminars led by experts are crucial to reinforce these efforts, as to expand waste education beyond the classroom:

"...so naa lang siguro'y training ani kung kinsay in charge dira sa Panabo City mag invite gud og kanang resource speaker... dapat kato gung hawod ani nga area about proper waste disposal." IDI_T2

(...so maybe there should be training for whoever is in charge there in Panabo City to invite a resource speaker... it should be someone in charge of this area about proper waste disposal.) IDI_T2

"...orientation seminars mao na ang kailangan nila same atong nabasa nako na theme about hands-on talk on segregation na Tamang Segregasyon: Alamin at gawin mga ingon ana na mga seminars ba." IDI_T3

(...orientation seminars, that is what they need, like what I read about the theme on hands-on talk on segregation called Tamang Segregasyon: Alamin at Gawin, those kinds of seminars.) IDI_T3

"...trainings...orientation siguro unya actual kanang kuan gyud hands on sa bata...invite nato ang DENR Oh kay sila man ana..." IDI_T4

(...trainings... orientation maybe, then actual hands-on for the children... we can invite DENR because they are responsible for that...) IDI_T4

"...mag invite og speakers, then sa teachers muna then sa pupils...naay tema na pasok jud sa atong elementary pupils na in progress pwede sila maging eco hero sa munting paraan." IDI_T5

(...invite speakers, then for the teachers and the pupils... There is a theme that fits our elementary pupils like they are in progress, and they can become eco-heroes in small ways.) IDI_T5

Based on teachers' insights, expanded waste management systems provide more than just trash bins; they also include increasing waste disposal facilities such as Material Recovery Facilities (MRFs) and additional bins and sacks to manage growing waste volumes. Teachers recognize the significance of assigning designated personnel to oversee specific waste areas to ensure proper disposal of waste and segregation. They also emphasize that education and training initiatives for teachers and students are vital to these systems. These initiatives seek to enable school communities, especially young students, to play proactive and accountable roles in waste reduction and environmental stewardship by fusing infrastructure upgrades with capacity-building initiatives.

This viewpoint is supported by Nguyen et al.'s (2021) study of waste management expansion strategies in Vietnamese primary schools, which discovered that improving waste segregation and reducing inappropriate waste disposal were achieved by increasing the number of trash cans that were easily accessible, designating student eco-ambassadors, and holding teacher training sessions. The study that was published in Sustainability demonstrated how giving teacher's basic management tools and giving students more authority greatly improved school-wide waste systems. The findings show that basic trash problems can be effectively addressed by hands-on extensions centered on participation and education.

López et al., (2022) investigated the expansion of school-based waste segregation programs in urban Latin America to further this concept. Their study, which was published in Environmental Education Research, demonstrated that the accuracy of waste reduction and segregation in schools was greatly improved by adding more trash cans, involving students in interactive activities, and equipping teachers with training on appropriate waste management techniques. The study emphasized that actions to improve teacher and student competency, as well as better infrastructure, strengthen the sustainability of school waste programs.

In a related study, Okeke and Adebayo (2023) looked at how teacher-led trash management programs affected primary schools in Nigeria. Based on their study, which was published in the Journal of Cleaner Production, when waste management systems were extended by adding collection stations and including trash disposal responsibilities into the curriculum, students' environmental awareness and garbage disposal behavior improved? This community-based approach, which focused on education and basic infrastructure improvements, effectively addressed the underlying waste issues in schools lacking state-of-the-art equipment.

Kolb's Experiential Learning Theory (1984) offers a convincing framework for comprehending the efficacy of increased school waste management systems, which lends credibility to these findings. Kolb asserts that learning happens via a cycle of tangible experience. As stated to this view, learning occurs most effectively when students actively participate in real-world tasks that call for critical thinking. It explains how teacher and student involvement in garbage segregation, environmental awareness initiatives, and hands-on training foster a deeper understanding and long-lasting, sustainable behaviors in the context of school waste management. Students who actively participate internalize environmental ideals through meaningful experiences rather than passively absorbing knowledge.

Strengthen Waste Education Responsibility. Despite existing facilities like MRFs, schools experience difficulties establishing constant waste responsibility among learners. Teachers emphasized the need for clearer regulations, early education, and improved infrastructure, such as more clearly labeled bins.

Participant coded IDI_T2 shared:

"... as teacher usa ka mag hatag sa rules at the same time eh educate sa nimo ang mga bata... Unya kana sang pag dugang og basurahan sa every corner sa school better pod na siya nuh for school improvement aside sa among MRF." IDI_T2

(...as a teacher, you are the one who gives the rules, and at the same time, you educate the children... Moreover, adding trash bins in every corner of the school is also better for school improvement aside from our MRF.) IDI_T2

Moreover, participant-coded IDI_T3 suggested that:

"...ang akua lang ikasuggest... kung naa silay basura ibutang lang sa ilang bag then they can bring it at home... also, magdugang pod og basurahan sa gawas sa mga classrooms..." IDI_T3

(...what I can suggest is if they have trash, just put it in their bag, then they can bring it home... also, add more trash bins outside the classrooms...) IDI_T3

In addition, participant-coded IDI_T4 recommended a more organized waste disposal system in every building:

“...except sa MRF sa every corner siguro, every building naa jud tulo ka klase nga basurahan. ...para at least ang bata ba bisan asa moadto mag kaon naa dayon siya malabayan...” IDI_T4

(...except for the MRF, maybe every building should have three kinds of trash bins in every corner. ...so at least the child, wherever they go to eat, there is immediately a place to throw their trash...) IDI_T4

Furthermore, participant coded IDI_T5 identified the significance of regular and early orientation as an important strategy:

“More orientation, kana gyud siya, tapokon ang mga bata para at least kanang makabalo sila na like grade one palang dapat e impose na sa ilaha na dapat e separate na ang basura.” IDI_T5

(More orientation, that's really it, gather the children so at least they will know that even in grade one, it should already be imposed on them that the trash should be separated.) IDI_T5

Lastly, both participants coded IDI_T3 and IDI_T4 highlighted the importance of student involvement through school organizations:

“...group of pupils ba organization, YES-O ba so ilang ginabuhay is sila ang nagapamunit og mga basura around the area so best engagement na cia sa among mga students diria training na sa ilaha samtang mga elementary pa sila.” IDI_T3

(...group of pupils like an organization, YES-O, so what they do is they pick up trash around the area, so that is the best engagement for our students here, that is training for them while they are still in elementary.) IDI_T3

“...naa ni silay YES-O student organization nga pwede mo lead ug ang adviser maghimo silag action ba na ang bata naa jud siya’y proper... participation sa proper waste management.” IDI_T4

(...they have a YES-O student organization that can lead, and the adviser makes an action so that the child has proper... participation in proper waste management.) IDI_T4

The theme highlights the value of implementing appropriate school waste management procedures, with teachers emphasizing shared responsibility and consistent reminders to promote positive habits. They view themselves as role models encouraging students to be disciplined and accountable. To encourage students to take responsibility for their waste, participating teachers highlight the "Basura Mo, Sagot Mo" concept. Their emphasis is on the necessity of strategically positioned waste bins to promote proper segregation practices. Participation in school-based eco-groups and early instruction on environmental responsibility is essential for fostering sustained awareness and active involvement among students. These findings advocate for the integration of environmental education into the core curriculum. Educators regard it as a valuable approach for cultivating environmental awareness among their students, encouraging discipline, and instilling a sense of waste responsibility.

This is consistent with the findings of Taypin et al., (2024) in their study at Kiblawan Central Elementary School, which highlighted that incorporating environmental education into the core curriculum serves as an effective approach to enhancing waste responsibility. The findings indicated a significant relationship between students' awareness, waste management practices, and their engagement in school organizations. The results indicate that the cultivation of sustainable behaviors is directly facilitated by educational resources that enhance environmental awareness. The results suggest that educational materials aimed at enhancing environmental awareness can effectively promote sustainable practices.

In addition to this notion, Ambarita et al., (2024) indicated that waste management plays a crucial role in sustainable development within primary schools. This study highlights the importance of schools in fostering sustainable development through the adoption of efficient waste management strategies. The authors highlight the significance of integrating waste education into the curriculum by analyzing and emphasizing the contributions of both educators and learners. Important themes highlighted by the study encompass the necessity of incorporating waste management into educational systems, enhancing teacher awareness, and fostering student participation.

This emphasis on engagement and modeling aligns with Bandura's social cognitive theory (1986), which posits that the interplay of personal factors, environmental influences, and behaviors shapes human actions. In the context of waste management education, students are more likely to adopt responsible behaviors when they understand the importance of proper waste disposal and consistently observe peers or role models, such as teachers, practicing these habits. The findings suggest that achieving long-term sustainable development in educational institutions requires fostering a mindset of environmental stewardship.

Language Aided Waste Segregation. Participant-coded IDI_T2 explained how students could be guided to properly sort waste by using visual aids on trash cans:

“...ang mga trash bins naa siyay label at the same time naa siyay mga pictures sa mga kinds gani sa basura sama ani nga basura o waste para dira na...” IDI_T2

(...the trash bins have labels and, at the same time, have pictures of the kinds of trash like this kind of trash or waste so that it goes there...) IDI_T2

Participant coded IDI_T3 encouraged a perspective that waste is an ethical duty and instilling personal accountability in students:

“...you can bring your waste like... basura mo sagot mo...” IDI_T3

(...you can bring your waste like... your trash, your responsibility...) IDI_T3

Additionally, participant-coded IDI_T4 emphasized the use of practical strategies like language-inclusive labeling:

“...makasabot mana sila kung naay mabutang na names or labels gud from Bisaya, tagalog ug English kumbaga butangan og mga examples intended ana nga basurahan ba kani ang examples sa nabubulok, kani ang examples sa di-nabubulok ug sa pwede pa ma recycle...” IDI_T4

(...they will understand if there are names or labels placed from Bisaya, Tagalog, and English, like putting examples intended for that trash bin, like these are the examples of biodegradable, these are the examples of non-biodegradable and those that can still be recycled...) IDI_T4

To add to that, participant coded IDI_T5 pointed out the significance of localized and visible signs, especially at the Materials Recovery Facility (MRF) of the school:

“...since naa man mi MRF karon so dira ginalabay ang mga basura butangan lang guru og clear or dagko na labels kung mahimo kanang naka Bisaya para masabtan jud sa mga bata na molabay sa among MRF...” IDI_T5

(...since we already have an MRF now, that is where the trash is thrown; maybe just put clear or big labels, if possible, in Bisaya so the children who throw trash in our MRF can understand...) IDI_T5

Effective and clear communication is essential in pursuing sustainable waste practices within elementary schools, especially in educating young learners. Several participating teachers highlighted that using labeled

trash bins and visual aids enhances students' understanding of proper waste segregation. Language-aided waste segregation is the process of improving students' comprehension and application of proper waste segregation by the use of written, spoken, and visual language resources, such as multilingual labels, class discussions, and instructional materials. This method improves students' comprehension of environmental concepts and influences their daily routines in a positive way through comprehension and constant reinforcement.

A study by Wang and Zhang (2022) supported this practice by examining the effects of linguistic and visual labels on garbage segregation practices in diverse urban schools. Their research, published in the International Journal of Environmental Research and Public Health, demonstrated that trash cans labeled with multilingual text and culturally relevant images improved waste sorting accuracy when compared to those with single-language labels. This study emphasizes the need for inclusive communication techniques for improving student comprehension and encouraging active involvement in waste management, especially in multiethnic or multilingual metropolitan school environments.

In support of these conclusions, Gavins et al., (2023) from the University of Sheffield emphasize how language can change environmental behavior, especially when it comes to trash management. Their research focuses on how we name and define waste categories and discuss plastic garbage, which has a direct impact on how people, particularly elementary school pupils, react to environmental challenges. Labeling trash cans in an educational setting with visual aids and multilingual terms (such as English, Filipino, and Bisaya) helps elementary students, particularly those in multilingual communities or younger students, understand which materials belong in which category (biodegradable, non-biodegradable, or recyclable).

This approach aligns with Vygotsky's Sociocultural Theory (1978), which posits that learning occurs through social and cultural settings and utilizing language as a cognitive tool. This theory emphasizes that learning is deeply influenced by language and cultural resources. Trash bins with multilingual labeling and culturally relevant images act as scaffolding to help students grasp a variety of classroom situations. Students engage with environmental topics socially and culturally relevantly when language (such as Filipino, English, or Bisaya) is embedded in commonplace items like trash cans. This promotes deeper learning and behavioral change.

Supported Waste Management Initiatives. Participant coded IDI_T2 stated the value of using rewards to encourage behavior in addition to providing bins:

"...mag provide sila og basurahan... maghatag og recognition ang administration sa mga teachers, students, o grade level ug section na best in like green guardian award for consistently proper waste segregation or disposal or... eco warrior of the month..." IDI_T2

(...they will provide trash bins... the administration will give recognition to the teachers, students, or grade level and section that is best in like Green Guardian Award for consistently proper waste segregation or disposal or... Eco Warrior of the Month...) IDI_T2

Similarly, participant coded IDI_T3 raised a concern about the absence of basic waste management facilities, specifically garbage cans:

"...wala mi mga trashcans mao na ang problema so mao guro na ang dapat e support sa administration..." IDI_T3

(...we do not have trashcans; that is the problem, so maybe that is what the administration should support...) IDI_T3

Moreover, participant-coded IDI_T4 discussed how teachers prepared to approach school administration to ask for the installation of garbage cans with labels for each building:

“...sa amoang administration siguro na pabutangan lang gyud diha”g mga basurahan kada corner with labels mao lang gyud na amoang... as teacher pwede ko mo estorya kang Sir Principal, pwede ba ta moprovide og bins sir kada building ba...” IDI_T4

(...to our administration, maybe just put trash bins in every corner with labels, that is our... as a teacher, I can talk to Sir Principal, can we provide bins for every building...) IDI_T4

Participant-coded IDI_T5 encourages inviting speakers who can reinforce the important message with the support of those in positions of authority:

“... mag invite sila og mga speakers... atleast dili lang nila sa teacher madungog bahin ana naa jud tao or authority na naga istorya about sa waste management.” IDI_T5

(...they will invite speakers...at least it is not only the teachers who hear about it; people or authorities are talking about waste management.) IDI_T5

The teachers emphasized how important it is to have strong administrative support when putting school waste management programs into action. They acknowledged the need for basic facilities like properly labeled trash cans and incentive schemes like reward systems to encourage proper waste disposal. Teachers also expressed their willingness to advocate for improvements and suggested inviting credible speakers to reinforce environmental topics. The results highlight how crucial infrastructure and institutional assistance are to encourage sustainable waste management in schools.

The effects of supported elementary school trash management initiatives in semi-urban India were investigated by Patel and Kumar (2022). Their study, which was published in Environmental Science and Pollution Research, found that when schools were given more trash cans, teacher training, and student-led waste clubs, waste reduction and segregation improved significantly. This highlights the significance of institutional support and educational empowerment.

Santos and Dela Cruz (2023) investigated community and school partnerships to promote waste management projects in the Philippines, which lends belief to this viewpoint. In order to improve waste segregation and recycling at the school level, their findings, which were published in Waste Management & Research, emphasized the need to include instructors and students in seminars and practical training. As stated to the study, continuous institutional and governmental support, such as the supply of resources and the organization of orientations, effectively encourages school waste management practices without the need for high-tech solutions.

This concept is reflected in Bronfenbrenner's Ecological Systems Theory (1979), which describes how different environmental systems, such as families, communities, schools, and governmental institutions, interact to influence students' behavior and education. The significance of these interrelated systems supporting effective waste management methods is shown in the emphasis on community cooperation, teacher preparation, student involvement, and institutional support.

Table 3. Emerging Themes and Core Ideas on Teachers' Perceptions of Their Roles in Promoting Proper Waste Disposal at Valentin N. Daquio Elementary School

Themes	Core Ideas
Leading by Example	<ul style="list-style-type: none"> Teachers must lead by example and not only give instructions. Being a role model is an inherent expectation of teachers. Teacher initiative influences student action. Teachers lead in implementing rules, and students tend to follow. Cleanliness serves as a motivation. Personal motivation is needed to maintain proper waste disposal.

	<ul style="list-style-type: none"> • Seeing a clean school motivates efforts.
Integrating Waste Education	<ul style="list-style-type: none"> • Waste disposal lessons are integrated into the subject content. • Proper waste disposal is included when relevant to the lesson. • Waste management must be part of the curriculum. • Teachers actively enforce rules against careless garbage disposal. • Imposing rules helps children internalize good habits, benefiting school and community environments. • Proper waste disposal management in schools has a significant positive impact. • Effective waste management leads to visibly cleaner surroundings, indicating project success.
Enforcing Classroom Rules	<ul style="list-style-type: none"> • Setting rules helps students internalize good behaviour. • Imposing rules encourages student compliance. • Classroom rules are necessary to maintain order and discipline.
Providing Constant Reminder	<ul style="list-style-type: none"> • Students need regular reminders. • Rules on proper waste disposal serve as daily reminders. • Constant reminders are necessary.

Shown in Table 3 are the core ideas and themes generated from the participant's responses to the second objectives which is their Perceptions of Their Role in Promoting Proper Waste Disposal at Valentin N. Daquio Elementary School.

Leading By Example. The theme focuses on the role of a teacher in promoting proper waste disposal in the school by leading by example.

Furthermore, the following statements support this theme:

“So si teacher dapat jud ang mag-set as an example no, dili pud pwede nga sige rakag panugo, sige rakag hatag ug instruction...” IDI_T2

(So, the teacher should set an example. You cannot just keep giving orders; keep giving instructions...) IDI_T2

“Siguro, wala pod siguro”y teacher na di magpa role model...” IDI_T4

(Maybe, maybe there's really no teacher who doesn't want to be a role model...) IDI_T4

“... pag dili ikaw mag una di sad sila mo lihok so kailangan magset ka as an example...” IDI_T5

(... if you're not the one to start, they also won't act, so you need to set an example...) IDI_T5

“Unang una gud ang mga teachers gud ana mag implement ug kuan sa amoang learners, amo pong learner”s mo sunod pud sila...” IDI_T1

(First of all, it's really the teachers who implement things to our learners, and our learners also follow them...)

IDI_T1

“... kanang ga motivate nalang ang kalimpyo...” IDI_T3

(... it's just that cleanliness motivates us...) IDI_T3

“... motivate imong kaugalong about proper waste disposal murag matulog mo dira sa inyong classroom nga magdulog sa basura mao na siya.” IDI_T4

(... motivate yourself about proper waste disposal, like you'd sleep there in your classroom with trash all around—that's what it is.) IDI_T4

"Motivation nalang guro namu kanang Makita namu ang school nga limpyo, kana gyud." IDI_T5

(Maybe our motivation is just seeing the school clean, that's really it.) IDI_T5

Teachers saw themselves as role models for children regarding proper garbage disposal. Children are perceptive and often mimic the actions of adults, especially those in positions of power like their teachers. In addition, teachers are viewed as role models for morals, values, and discipline. Students are more willing to follow when the teacher takes responsibility for waste management. Teachers must also model the discipline they want to teach since actions speak louder than words.

Bandura's Social Learning Theory (1977) highlights that behavior adoption relies heavily on modeling. A teacher regularly disposing of garbage appropriately is an example of positive behavior that students are likely to imitate. As the theory mentions, people learn more by watching others than by receiving only instruction. As Wang et al., (2022) explained, teachers who actively modeled ecologically friendly habits in classrooms significantly influenced learners' attitudes and actions about conservation. Role modeling has been demonstrated to increase the perceived importance of sustainability education.

Enforcing Classroom Rules. This theme highlights teachers' role in developing and enforcing classroom regulations that help learners dispose of waste properly.

Moreover, a participant with the code IDI_T2 shared that:

"... ikaw man ang in charge saimong classroom, syempre magset jud kag rules regarding ana. Saimong classroom palang daan, imo nanang gi-impose na rules para kung mugawas sila, nakasulod na sa ilang hunahuna..." IDI_T2

(... since you are in charge of your classroom, of course, you have to set rules about that. Just within your classroom, you have already imposed rules so that when they go out, it is already in their minds...) IDI_T2

Similarly, participant-coded IDI_T3 emphasized that:

"Okay kadto. mag impose jud ko og rules para mag follow ang mga pupils." IDI_T3

(Okay, that one. I impose rules so that the pupils will follow.) IDI_T3

In addition, participant-coded IDI_T4 suggests that:

"... So, need jud magset kag patakaran sulod sa classroom na angay nila sundon aron di gubot ba no."

IDI_T4

(... So, it is necessary to set rules inside the classroom that they should follow to avoid chaos.) IDI_T4

Teachers mentioned that setting regulations in the classroom guarantees those children will recognize the value of hygiene and adhere to correct waste management practices. Following cleaning procedures, keeping the classroom neat, and putting trash in the appropriate bins are examples of these guidelines. Teachers who constantly enforce these standards assist students in internalizing the ideals of responsibility and order. These actions eventually become second nature and transcend the classroom. Teachers believe maintaining discipline and encouraging pupils to behave consistently requires strictly enforcing classroom rules. With the help of defined procedures and unambiguous expectations, students progressively acquire the self-control necessary to manage waste appropriately.

Yilmaz et al., (2020) state that primary school environmental education programs that follow the rules benefit student compliance. Through structured guidelines, children learn discipline in trash management and expectations. Selman and Dilworth-Bart (2023) state that establishing rules and routines provides a secure setting where learners can repeat and internalize responsible behaviors, such as environmental stewardship, through guided autonomy.

Integrating Waste Education. Participants shared that waste disposal lessons should be embedded in subjects. Furthermore, the following statements support this theme:

“... Okay kanang kasagaran amoang pag implement ana gina integrate namo na sa amoang subject.” IDI_T1

(... Okay, when we implement that, we integrate it into our subject.) IDI_T1

“... kung nay mga lesson na pwede ma integrate ang proper waste disposal didto siya ipasok.” IDI_T3

(If there are lessons where proper waste disposal can be integrated, that is where it is inserted.) IDI_T3

“... kani masulod ni siya sa among EPP mao na ang kuan ba masulod siya sa among curriculum kay naa man mi kuan didto labi na sa EPP namo naa gyud siya “y proper waste disposal...” IDI_T4

(... this fits into our EPP, so it fits into our curriculum because we have that, especially in our EPP, which includes proper waste disposal...) IDI_T4

“... mga teachers diri naga implement gud na sila na dili mag pataka og labay sa basura...” IDI_T1

(... the teachers here implement the rule of not carelessly throwing garbage...) IDI_T1

“... kung maimpose lang ni, masulod lang sa hunahuna ug kasing-kasing sa mga bata so okay kayo atong environment sa school maapil rapud na ang environment sa community.” IDI_T2

(... if this can just be imposed, it will enter the minds and hearts of the children, so our school environment will be good, and the community environment will also be included.) IDI_T2

“... dako jud ni siya na impact kung kaning waste disposal management maipose jud siya sa school...” IDI_T3

(... this will greatly impact if this waste disposal management is truly imposed in school...) IDI_T3

“Siguro kanang, kay tungod sa ginabuhay nga waste management makita namo among palibot ba kanang ahh limpyo kayo siya so meaning kuan ang among project nga gibuhay kay kanang effective ba...” IDI_T5

(Maybe, because of our waste management, we can see our surroundings, like, ahh, they are immaculate, so it means that the project we are doing is effective...) IDI_T5

The participants also agreed that it is crucial to incorporate instruction on appropriate waste management into the standard school curriculum. For instance, Edukasyong Pantahanan at Pangkabuhayan (EPP) is a topic that teachers frequently use to teach waste management. Based on this idea, environmental education should be incorporated into regular teaching procedures rather than being approached as a separate subject. Using curricular integration, students get practical applications and information about environmental challenges. The importance of waste management is more likely to stick with pupils when exposed to it in various circumstances. Some even stated that a properly executed school waste management program can broadly affect how pupils behave at home and in the community.

As stated by Martínez-Borreguero et al., (2020), education for sustainable development should be incorporated into the curriculum to equip students to handle environmental concerns worldwide. Teaching waste management as a component of core courses makes it more relevant and guarantees that it is not handled as a

stand-alone subject. Corpuz et al., (2022) believe that students respond more effectively to the material and apply what they have learned in many circumstances when environmental education is incorporated into the curriculum. Through integration, pupils might perceive waste management as a natural part of life.

Providing Constant Reminders. Teachers emphasized that learners require frequent reminders to maintain excellent practices.

Participant coded IDI_T2 observed:

"Kato lang... ah regular reminder sa mga bata." IDI_T2

(Just that... ah, a regular reminder for the kids.) IDI_T2

In line with this, participant coded IDI_T3 shared:

"... Relate lang gihapon kadtong... mag impose ka og rules about proper waste disposal that will serve as their daily reminder gud." IDI_T3

(... Still related to that... you impose rules about proper waste disposal that will serve as their daily reminder.) IDI_T3

In addition, participant-coded IDI_T5 emphasized that constant reminder make difference:

"... kailangan sila I ano gyud kanang iremind, kanang nakabuhat nakag ing-ana nga project na naa silay ginabuhat nga buhaton gyud nila makalimot man gud usahay, unya lilabi na sa ka busy sa maestro usahay pud makalimtan. kailangan nimu sila I- monitor pud. kailangan jud nimu i-monitor ang bata." IDI_T5

(...they really need to be reminded, like when you've already done that kind of project and they have something they need to do, because sometimes they forget, especially when the teacher is busy, it can also be forgotten. You really need to monitor them. You really need to monitor the child.) IDI_T5

Teachers believed that constant reminders were crucial in improving students' waste disposal discipline. These reminders act as regular prompts for enhancing previously learned habits. Teachers described it as a daily reinforcement that keeps kids focused on cleanliness and correct garbage disposal. Verbal reminders, signage, and daily routines help students meet their obligations. It also contributes to addressing the knowledge-action gap. Reminders prompt habit-building even when students recognize the need for proper garbage disposal. This constant reinforcing process is essential in schools where students still feel personal and environmental responsibility.

In line with Skinner's (1953) reinforcement theory, frequently reinforced activities are more likely to become habits. Reminders provide positive reinforcement, assisting children in developing enduring routines. Chen et al., (2025) found that environmental education activities that included repetition and monitoring improved behavioral outcomes. Students built stronger habits and increased their environmental awareness when reminded and tracked regularly.

CONCLUDING REMARKS AND IMPLICATIONS

This section presents the conclusions and recommendations. The researcher concludes the collected data and formulates recommendations based on the study's findings and objectives.

Conclusion

In the process of putting in place appropriate procedures for waste management, the teachers at Valentin N. Daquio Elementary School confront a number of challenges. The most common issues include insufficient

waste segregation, a lack of student discipline over proper garbage disposal, and a shortage of trash cans or areas designated for recycling and other waste types. One major issue is the lack of adequate waste management infrastructure, which makes it difficult for teachers to model and enforce good disposal practices. Furthermore, even though teachers try to teach students how to properly separate trash, they are hindered by their erratic participation and awareness, which are influenced by both the customs that exist within the school and the norms that are common in the community outside of it.

The issue is additionally exacerbated by outside factors, such as the community's poor waste management practices, unclear waste laws, and a lack of significant government support. As stated by the teachers, reforms might be made by creating more open school rules, offering stronger administrative support, and making sure that adequate supplies, such as cleaning supplies and bins with labels, are available. Furthermore, they advocate for continuous training and professional development focused on sustainable practices and environmental education.

Teachers see themselves as essential characters in the process of promoting proper waste disposal and acknowledge their need to operate in an environmentally responsible manner. However, they usually find it challenging to balance these tasks with their academic commitments. Despite these challenges, a lot of people are motivated by the desire to create a healthier and cleaner learning environment and instill environmental values in students that will serve them well throughout their lives. When all is said and done, teachers believe that their work has a significant influence on students' behavior and positively affects the school environment. Addressing the internal constraints as well as the external factors that arise will be crucial to increasing the effectiveness of the school's waste management practices.

Implications

The results lead one to develop varied ideas on how Valentin N. Daquio Elementary School ought to enhance its waste management system. First, enhancing the waste management system of the school is developing or enlarging the Materials Recovery Facility (MRF) and placing extra trash cans all across the school premises. Moreover, constant monitoring and keeping cleanliness would depend on appointing skilled people to supervise certain regions. Not only should practically waste education be used for employees but also for students whose specialists from companies like DENR provide hands-on direction via regular training and seminars such as "Tamang Segregasyon: Alamin at Gawain." To inculcate environmental responsibility, encouragement of student involvement in environmental groups, including YES-O, task assignments in clean-up projects, and project tracking, would help to raise student participation. More so, the use of multilingual and visual aids, such as images-based labeling of trash containers in Bisaya, Tagalog, and English, would help every pupil grasp waste separation. Furthermore, crucial is raising government and society support; school leaders should fund waste management initiatives and coordinate with outside organizations using money and logistics to keep them going. These findings may serve as a springboard for future research or related investigations by exploring the effectiveness and sustainability of proposed interventions using different study designs, such as experimental or longitudinal approaches.

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