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Assessing Knowledge and Behaviors in Solid Waste Management: Building Blocks for Sustainable Programs

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Abstract: Students' awareness and practices regarding solid waste management play a crucial role in promoting sustainability and environmental responsibility. This study, "Assessing Students' Awareness on Solid Waste Management: Basis for a Program Proposal," examines the level of awareness and actual waste management practices among senior high school students at Partida National High School. Using a quantitative research design, data were collected from 303 respondents to determine their knowledge and application of key waste management principles, including recycling, reusing, reducing, recovering, and repairing. The findings reveal a strong positive correlation between awareness and practices, indicating that students with higher awareness levels are more likely to engage in proper waste management. However, gaps in knowledge and challenges in implementation such as lack of resources, facilities, and institutional support hinder effective practice. Based on these findings, this study proposes a program that aims to bridge the gap between awareness and action through education, school initiatives, and community involvement. By enhancing students' knowledge and providing them with the necessary tools and support, the program seeks to cultivate a culture of responsible solid waste management in the school and beyond.

Keywords: *Solid Waste Management, Awareness, Practices, Environmental Sustainability, School-Based Program.*

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I. INTRODUCTION

Solid waste management is a central global concern that has garnered increasing attention due to rapid urbanization and population growth witnessed over the past few decades. Lacking knowledge about solid waste has an impact on people. Learning and having knowledge on solid waste was enable to help in prevention of such illness that caused of waste. The study revealed that solid waste management in kabul is inadequate and faces challenges. Locals are concerned about waste but lock of knowledge about hazardous waste and recycling. Neglect from the government and public leads to health issues, such as injuries and water contamination. This can lead to the emergence of new ecozones. To ensure environmental protection and public health, more effort is needed from the government, environmental agencies and the public. The system needs behavioral changes and better waste management practices (Azizullah. Y 2019). A study by Montalbo and Dominguez (2019) Found that while awareness of environmental issues among Filipino students is relatively high, there remain gap in translating this awareness into effective waste management practices. This underscores the importance of educational institutions in fostering not only awareness but actionable behaviors among students to mitigate the challenges of solid waste management.

Effective solid waste management poses a significant challenge for numerous countries. Inadequate waste management can have far-reaching consequences, affecting not only public health and the environment but also socio-economic stability (Kilaton, L. J. et al., 2023).

The importance of addressing solid waste management within educational institutions cannot be overstated. Schools' universities are microcosms of society, and the behaviors cultivated in these environments often expand into broader community practices. By focusing on the awareness and practices of students of students, educational institutions have the potential to significantly influence waste management behaviors both within and outside their

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campuses. Moreover, as future leaders and decision-makers, students play a pivotal role in shaping sustainable communities, reducing the environmental impact and promoting a healthier ecosystem.

This research evaluated the awareness, attitudes, and practices of high school students at a Diocesan Catholic School regarding solid waste management (SWM). The study revealed that students demonstrated a high level of awareness, held very positive attitudes, and engaged extensively in SWM practices, with these factors remaining consistent across different sexes and academic levels. Notably, significant correlations were observed between awareness and practice, as well as between student demographics and their SWM practices. Ultimately, the study showed that awareness and attitude are strong predictors of students' SWM practices. It further provided baseline information in designing a comprehensive and effective SWM program to mitigate the problem of solid waste in the school Reyes and Madrigal 2020)

This research focuses on evaluating students' understanding of waste management and its impact on their waste disposal behaviors. Employing a descriptive correlational research design, the study used standardized questionnaires as the main method for collecting data from students in a public school in Bulacan. The data underwent statistical analysis, specifically regression analysis, to ascertain how students' awareness of waste management influences their waste disposal actions (Santos & Pastrana, 2021).

A more sustainable approach to waste management emphasizes practices like minimizing production, classifying waste, reusing materials, recycling, and recovering energy, moving beyond traditional methods such as landfilling, open dumping, and incineration. This approach, still in its initial phases but gaining traction in the Global South, is more inclusive, environmentally conscious, and has a reduced negative impact on both human health and the environment compared to conventional practices. However, there is a limited body of research on the effects of SWM practices on human health and the environment in global regions (Meegoda, 2022).

Effective waste management requires innovative solutions and strategies to achieve favorable outcomes. Implementing specific approaches can help decrease waste, lessen its ecological footprint, and foster a cleaner future. Key practices in waste management can significantly contribute to creating a healthier environment, supported by various waste management business concepts. It's crucial to maintain the waste management hierarchy while exploring these opportunities (Patel, 2024).

Many nations grapple with the challenge of solid waste management. Inadequate solid waste management can lead to various health, environmental, and socioeconomic challenges. Given that educational institutions play a pivotal role, and in accordance with R.A. NO. 9003, concepts of solid waste management are being integrated into science education. Research indicates that students possess sufficient knowledge regarding the definition of solid waste, the repercussions of improper disposal, prohibited activities related to solid waste, school-led initiatives for waste management, the importance of managing solid waste, and their own responsibilities (Molina & Catan, 2021).

This investigation sought to identify the correlation between the level of awareness and practices related to solid waste management among Filipino college students. The study's results indicated that students are generally aware of solid waste management policies and practices. While they are mostly informed about the policies and management of SWM, their understanding of their individual roles in implementing SWM is relatively limited (Bautista, P. R., 2019).

Ineffective solid waste management is a significant concern in many institutions. It leads to a depletion of resources, scarcity, and increased waste, which exerts pressure on the environment and adversely affects human well-being. Therefore, this study primarily seeks to evaluate students' awareness and practices concerning solid waste management. Specifically, it aims to determine the extent of students' awareness regarding solid waste management practices, including segregation, reduction, reuse, recycling, and disposal, and to identify any significant relationships between their awareness and actual practices (Diestro, D., 2022).

The primary goal of this research was to assess students' knowledge of solid waste management, focusing on segregation, recycling, reuse, and proper waste disposal. Additionally, this study aimed to evaluate the level of awareness and practices related to solid waste management among students at Partida National High School. The specific objectives included: assessing the current level of awareness of solid waste management concepts among students, identifying students' engagement in practices related to solid waste management, analyzing the factors that influence students' waste management behaviors, assessing the effectiveness of existing waste management policies and programs at the institution, and developing an action plan based on the findings to improve solid waste management practices within the educational institution.

Several studies have investigated solid waste management (SWM) awareness and practices within educational institutions, highlighting the significance of this topic. Malit et al. (2024) conducted a study at Baguio Central University, aiming to ascertain the SWM awareness and practices of respondents in relation to segregation, waste reduction, recycling/reuse, and disposal. The findings indicated a high level of agreement concerning the implementation of SWM practices and a notable level of awareness among the respondents (Malit, L. S et. al., 2024).

Further research by Espiritu (2024) examined SWM programs and policies at Anao-Kiling Elementary School in Roxas, Isabela. The results demonstrated a significant level of awareness regarding policies related to segregation,

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reduction, reuse, and recycling among stakeholders. However, challenges persist concerning waste disposal, suggesting a need for enhanced implementation and advocacy efforts (Espiritu, E., 2024). Stakeholder participation levels varied, with the composting of biodegradable waste exhibiting the highest degree of implementation.

Gantang (2022) broadened the scope by analyzing SWM practices and awareness, considering the respondent profiles based on school classification and level. The study, involving participants from a public university, revealed strong agreement regarding segregation practices, but only agreement concerning waste reduction, recycling/reuse, and disposal. The respondents demonstrated awareness of diverse SWM practices and acknowledged a significant correlation between awareness and practice (Gantang, M. A., 2022).

In light of the imperative for effective SWM, Gunasinghe (2023) emphasized the detrimental health, environmental, and socioeconomic consequences arising from inadequate SWM. The study indicated that students possessed adequate knowledge regarding the definition of solid waste, the effects of improper disposal, prohibited activities, and school-based initiatives. This underscores the role of educational institutions as agents of change, particularly through the integration of SWM concepts into science education (Gunasinghe, S. D., 2023).

These studies collectively inform the investigation of student knowledge, attitudes, and preventive behaviors (KAP) pertaining to SWM in rural educational institutions. Furthermore, this examination includes an exploration of current institutional practices and the identification of opportunities to facilitate a transition toward a circular economy (Owojori, M. O et. al., 2022). In relation, Maphosa (2022) underscores the relevance of the study by highlighting the fact that E-waste generation outpaces current 5R initiatives (Maphosa, V., 2022).

In recognition of the importance of SWM, Alfeche et al. (2024) conducted a descriptive-quantitative correlation study at CNSF, a public secondary school. The study focused on awareness, understanding, attitudes, and practices related to SWM, aligning with Republic Act 9003, through the school's NO: T. I. S (No Trash In School) program (Alfeche, E. E et. al., 2024).

Finally, Sanson Jr. et al. (2024) developed an action plan encompassing a seminar-workshop and advertising campaign to enhance waste management implementation. The study advocated for support from Department of Education (DepEd) officials to facilitate the implementation of the school's intervention program, thereby promoting effective waste management practices (Sanson Jr., A. T et al., 2024).

The study further investigated the respondents' characteristics, including their school type and academic level, their engagement in various solid waste management practices such as segregation, waste reduction, recycling, reuse, and disposal, and their overall awareness of solid waste management. The findings indicated that the 612 participants were primarily from a public university-level institution. These respondents expressed strong agreement regarding solid waste management practices related to segregation. However, they indicated a general agreement concerning waste reduction, recycling and reuse, and waste disposal, alongside awareness of diverse solid waste management practices. The respondents also concurred that a notable relationship exists between students' awareness and their actual practices in solid waste management (Gantang, M. A., 2022).

Gunasinghe (2023) noted that ineffective solid waste management can result in various health, environmental, and socioeconomic challenges. Given the role of educational institutions as agents of change, solid waste management concepts are being integrated into science education. Their study demonstrated that students possess adequate knowledge regarding the definition of solid waste, the consequences of improper disposal, prohibited activities, school-based initiatives, and the overall importance of solid waste management.

Owojori et al. (2022) highlight that this understanding informed their study, which examined the knowledge, attitudes, and prevention strategies (KAP) of students at a rural educational institution concerning solid waste management. The research also aimed to assess the institution's existing practices and to identify potential steps toward a more circular economy model.

Moreover, environmental experts have voiced concerns about the rapid growth of e-waste, outpacing the implementation of the 5R's initiatives. Maphosa's (2022) study explores students' awareness and attitudinal tendencies in response to this issue.

Alfeche et al. (2024) describe how CNSF, as a public secondary institution, employed a descriptive-quantitative correlational research design through its NO: T. I. S (No Trash In School) program, which addresses Republic Act 9003 concerning the awareness, understanding, attitude, and practices related to solid waste management among its students, teachers, and staff.

Sanson Jr. et al. (2024) developed an action plan incorporating a seminar-workshop and advertising campaign focused on the latest waste management implementations. The study recommended that DepEd officials support the school's intervention program to enhance and develop effective waste management implementation

A. Research Questions

The main objective of this study is to assess the solid waste management awareness and practices of students. Specifically, this sought answers to the following problems.

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- *How May the Level of Awareness of Students Be Described in Terms of*

- recycling;
- reusing;
- reducing;
- recovering; and
- repairing?

- *How may solid waste management practices be described in developing action plan in terms of*

- Recycling;
- Reusing;
- Reducing;
- Recovering; and
- Repairing?

- *What Course of Program may be Proposed based on the Results?*

- *Is there a Significant Relationship between Solid Waste Management Awareness and Practices of Students'?*

II. METHODOLOGY

A. Research Design

This study employs a descriptive research method, specifically utilizing an educational survey approach. Descriptive research aims to systematically and accurately describe a population, situation, or phenomenon, addressing questions such as "what," "where," "when," and "how" (McCombes, 2019). This method is suitable for assessing the awareness and practices of students at Partida National High School regarding solid waste management, particularly their knowledge, behaviors, and the effectiveness of existing initiatives.

The descriptive research approach enables the researchers to explore the nature of the students' awareness and their actual practices in waste segregation, recycling, and disposal. This study is structured to identify existing gaps and areas for improvement, forming the basis for an action plan aimed at enhancing solid waste management within the school.

To ensure the accuracy, reliability, and validity of findings, this research follows a structured process:

The first step involves determining key variables related to students' awareness and practices concerning solid waste management. The researchers will analyze independent and dependent variables to assess how knowledge and behaviors influence waste management practices.

The second step involves an extensive review of existing literature on solid waste management among students. This will help identify knowledge gaps and establish a strong theoretical foundation for the study. By understanding previous research findings, the study aims to contribute new insights into improving waste management awareness and practices.

Selection of Research Methodology and Instrument DevelopmentIn this step, the researchers finalize the research methodology and construct a survey questionnaire tailored to assess students' awareness and practices. The questionnaire consists of five sections, addressing key research questions through close-ended questions using a Likert scale to measure students' levels of agreement and engagement with specific waste management practices.

The fourth step involves obtaining necessary legal permits and approvals before proceeding with data collection. The questionnaire will undergo validation by experts, including the research adviser and statisticians, ensuring content accuracy and relevance. A pilot test will be conducted among a small group of non-participating respondents to refine the instrument based on feedback and initial analysis.

After finalizing the questionnaire, data collection will commence through a structured administration process. The researchers will inform participants about the study's objectives, distribute consent forms, and ensure ethical compliance. Once consent is obtained, students will complete the survey, and responses will be gathered for reliability testing and statistical analysis.

The final phase involves analyzing collected data to assess students' awareness levels and waste management practices. Findings will be interpreted to formulate recommendations and an action plan, focusing on community education programs, training initiatives, awareness campaigns, monitoring and evaluation strategies, and collaboration with local organizations. The goal is to propose practical solutions to enhance waste management at Partida National High School.

Through this systematic approach, the study seeks to provide meaningful insights into students' awareness and practices regarding solid waste management, ultimately contributing to the development of sustainable solutions within the school community.

B. Respondents of the Study

This study utilized a stratified random sampling method. This technique was chosen because it is well-suited for selecting a representative subset of individuals from a larger, diverse population, ensuring that each student has an equal chance of being selected within their specific stratum (Jawad Golzar et al., 2022). This approach aims to obtain a sample that accurately reflects the characteristics of the overall student population at Partida National High School. Stratified random sampling is a widely used method in quantitative research that employs survey instruments, particularly when dealing with populations with distinct subgroups. In this study, the population consists of students from Grade 7 to Grade 12 at Partida National High School. By dividing the population into strata based on grade level, this approach ensures a more accurate representation of

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students' awareness and practices regarding solid waste management. As Lauren Thomas (2020) notes, stratified random sampling is valuable for making statistical inferences about a population and helps ensure high internal validity.

Table 1: Respondents of the Study

Grade Level	Frequency	Percentage
Grade 7	212	17.24%
Grade 8	243	19.76%
Grade 9	242	19.68%
Grade 10	192	15.61%
Grade 11	172	13.98%
Grade 12	169	13.74%
Total	1,230	100%

C. Data Gathering Procedures

The data gathering procedure involves key steps to ensure the collection of accurate and reliable information. (1) Instrument construction, where a survey questionnaire is designed to align with research objectives. (2) Validation and reliability testing, where the instrument undergoes assessment to confirm its effectiveness in measuring the intended variables. (3) Administration to target respondents, where the validated instrument is distributed following standardized protocols to ensure proper implementation. These systematic steps are crucial for obtaining high-quality data for analysis and interpretation.

D. Statistical Treatment of Data

To ensure accurate and reliable data interpretation, the following statistical tools were employed: weighted mean, standard deviation, and Pearson correlation coefficient (r). Additionally, IBM SPSS software was used for statistical analysis.

The following statistical tools were utilized in interpreting the data gathered from the study:

Weighted Mean and Standard Deviation – This was calculated to determine the average level of students' awareness of solid waste management based on their responses to a four-point Likert scale (1 = Not aware at all; 4 = Very aware). This method assigned different weights to responses, ensuring that more significant answers had a greater impact on the overall average. By doing so, researchers could identify specific areas where students may need additional information or education. This was used to measure the variability of students' awareness levels around the weighted mean. A low standard deviation indicated that most students had similar awareness levels, while a high standard deviation suggested considerable differences in awareness among students. This information helped researchers understand the consistency of awareness within the student population.

Pearson Correlation Coefficient (r) – This assessed the strength and direction of the relationship between students' awareness levels and their participation in waste management-related activities. This statistic helped determine whether higher participation was associated with greater awareness. The values of r ranged from -1 (indicating a strong negative correlation) to +1 (indicating a strong positive correlation), with 0 representing no correlation at all."

III. RESULTS

A. Awareness

➢ *Recycling*

Table 2: Awareness on Solid Waste Management of Respondents in Terms of Recycling

As a student…..	Weighted Mean	Verbal Description
1. I am aware of the different materials that can be recycled.	3.63	Strongly Agree
2. I believe that recycling helps reduce the amount of waste sent to landfills.	3.60	Strongly Agree
3. I know how to properly sort recyclable materials.	3.62	Strongly Agree
4. I have participated in recycling programs at my school or community.	3.48	Strongly Agree
5. I am aware of the environmental benefits of recycling..	3.60	Strongly Agree
6. The availability of recycling bins influences my decision to recycle	3.51	Strongly Agree
7. I believe that recycling can lead to economic benefits for my community..	3.51	Strongly Agree
8. My school provides adequate resources and information about recycling practices.	3.53	Strongly Agree
9. I am informed about the recycling policies in my community..	3.53	Strongly Agree
10. I feel confident in my knowledge about recycling processes..	3.50	Strongly Agree
Average	**3.55**	**Strongly Agree**

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Table 2 presents data on the respondents' awareness and practices regarding recycling. The data indicates a strong agreement among respondents about their understanding of recyclable materials, participation in recycling programs, and the environmental benefits of recycling. The highest weighted mean, such as awareness of recyclable materials (3.63), reflects the effectiveness of educational programs or campaigns in fostering knowledge. Meanwhile, slightly lower means, like access to information about community recycling policies (3.53), may suggest the need for better dissemination of such information. These findings emphasize that awareness and access to resources significantly influence recycling practices, reinforcing the importance of providing sufficient infrastructure, like recycling bins, and information campaigns to enhance participation.

The highest weighted mean in the Recycling category is 3.63, found in the statement, "I am aware of the different materials that can be recycled." This reflects the respondents' strong awareness of recyclable materials, consistent with the findings of Wang et al. (2021), which emphasize the significance of knowledge in encouraging sustainable recycling practices. On the other hand, the lowest weighted mean is 3.48, observed in the statement, "I have participated in recycling programs at my school or community." This indicates that while awareness is high, active participation in programs may be less consistent, likely due to logistical or motivational barriers, as suggested by Singh et al. (2019).

- *Reusing*

Table 3: Awareness on Solid Waste Management of Respondents in Terms of Reusing

As a student…..	Weighted Mean	Verbal Description
1. I feel confident in my ability when it comes in reusing materials.	3.55	Strongly Agree
2. I understand the concept of upcycling and its benefits.	3.48	Strongly Agree
3. I believe that reusing items can help conserve resources.	3.63	Strongly Agree
4. I have participated in events that promote reusing items.	3.42	Strongly Agree
5. I am aware of local organizations that facilitate item reuse.	3.49	Strongly Agree
6. I often donate items that I no longer need instead of throwing them away.	3.48	Strongly Agree
7. I encourage my peers to consider reusing before disposing of items.	3.51	Strongly Agree
8. I have reused materials for school projects or crafts.	3.54	Strongly Agree
9. I believe that reusing can reduce overall waste significantly.	3.56	Strongly Agree
10. I am knowledgeable about the environmental impact of reusing.	3.53	Strongly Agree
Average	**3.52**	**Strongly Agree**

Table 3 illustrates the findings on reusing practices demonstrate the respondents' strong belief in the importance of reusing materials to conserve resources and reduce waste. Statements such as "I believe reusing items can help conserve resources" scored the highest (3.63), showing an understanding of its environmental benefits. However, slightly lower means, such as participation in reusing programs (3.42), point to a potential lack of community-driven initiatives or limited opportunities to engage in these activities. These results highlight the need for schools and communities to promote upcycling projects, donation drives, and awareness campaigns to maximize the practice of reusing.

In Reusing, the highest weighted mean is 3.63 for the statement, "I believe that reusing items can help conserve resources." This indicates a strong understanding among respondents of the environmental benefits of reusing, supported by Priyadarshini and Abhilash (2020), who highlight reusing as a critical strategy for conserving natural resources. Meanwhile, the lowest weighted mean is 3.42 in the statement, "I have participated in events that promote reusing items." This suggests lower involvement in community or school-organized reuse activities, a pattern also observed by Singh et al. (2019), who identified limited access and awareness of such initiatives as significant barriers.

- *Reducing*

Table 4: Awareness on Solid Waste Management in Terms of Reducing

As a student…..	Weighted Mean	Verbal Description
1. I understand the importance of reducing waste in my daily life.	3.62	Strongly Agree
2.I consciously try to purchase products with minimal packaging.	3.48	Strongly Agree
3.I actively seek ways to reduce food waste at home.	3.54	Strongly Agree
4.I believe that reducing consumption is essential for environmental sustainability.	3.45	Strongly Agree
5. I have adopted habits that help me reduce my overall waste production.	3.59	Strongly Agree
6.My school promotes initiatives aimed at reducing waste generation among students.	3.56	Strongly Agree
7.I am aware of the impact of single-use plastics on the environment.	3.50	Strongly Agree

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8.I often encourage others to reduce their consumption habits.	3.45	Strongly Agree
9. I have learned about composting as a method for reducing organic waste effectively.	3.52	Strongly Agree
10.Reducing overall consumption should be prioritized by everyone involved.	3.53	Strongly Agree
Total	3.53	Strongly Agree

Table 4 The respondents exhibit a strong awareness of the need to reduce waste and consumption. Statements such as "My school has initiatives aimed at reducing waste generation among students effectively implemented throughout the year ahead" (3.61) and "Reducing overall consumption should be prioritized by everyone involved" (3.59) reflect a broad understanding of the importance of waste reduction. The respondents also report actively participating in reduction campaigns, with a weighted mean of 3.49 for "I actively participate in campaigns focused on reducing single-use plastics within my community," showing engagement in efforts to minimize waste at the community level. The statement "I feel informed about local events aimed at raising awareness regarding reduction strategies" (3.49) suggests there is a need for greater awareness programs. Despite the enthusiasm for reducing waste, the slightly lower mean for "I actively participate in campaigns focused on reducing single-use plastics within my community" shows that there may be room for improvement in mobilizing individuals to take more action in these efforts. The overall weighted mean of 3.53 and the standard deviation of 0.03 indicate a general consensus on the importance of waste reduction, but more could be done to encourage consistent participation in these initiatives.

- *Recovering*

Table 5: Awareness on Solid Waste Management in Terms of Recovering

As a student…..	**Weighted Mean**	**Verbal Description**
1. My community has established programs dedicated solely towards recovering valuable resources from discarded materials.	3.63	Strongly Agree
2. I actively participate in initiatives focused on promoting recovery processes within our local area.	3.56	Strongly Agree
3. My school teaches us about various methods used for effective resource recovery.	3.60	Strongly Agree
4. I believe energy recovery from waste plays an important role when it comes down to sustainability efforts.	3.56	Strongly Agree
5. My peers show interest when discussing innovative ways we could improve upon existing recovery practices.	3.53	Strongly Agree
6. I often volunteer during cleanup events where we focus specifically on recovering usable resources from trash piles.	3.56	Strongly Agree
7. Local authorities provide clear guidelines regarding how they handle recovered materials after collection.	3.54	Strongly Agree
8. I support policies encouraging businesses/organizations involved with resource recovery initiatives.	3.58	Strongly Agree
9.I feel knowledgeable enough regarding different types/methods utilized during successful material recoveries.	3.51	Strongly Agree
10.Recovery practices should be integrated into all aspects related towards solid waste management.	3.57	Strongly Agree
Average	3.56	Strongly Agree

Table 5 The respondents exhibit a strong awareness of the need to reduce waste and consumption. Statements such as "My school has initiatives aimed at reducing waste generation among students effectively implemented throughout the year ahead" (3.61) and "Reducing overall consumption should be prioritized by everyone involved" (3.59) reflect a broad understanding of the importance of waste reduction. The respondents also report actively participating in reduction campaigns, with a weighted mean of 3.49 for "I actively participate in campaigns focused on reducing single-use plastics within my community," showing engagement in efforts to minimize waste at the community level. The statement "I feel informed about local events aimed at raising awareness regarding reduction strategies" (3.49) suggests there is a need for greater awareness programs. Despite the enthusiasm for reducing waste, the slightly lower mean for "I actively participate in campaigns focused on reducing single-use plastics within my community" shows that there may be room for improvement in mobilizing individuals to take more action in these efforts. The overall weighted mean of 3.53 and the standard deviation of 0.03 indicate a general consensus on the importance of waste reduction, but more could be done to encourage consistent participation in these initiatives.

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➢ *Repairing*

Table 6: Awareness on Solid Waste Management in terms of Repairing

As a student…..	Weighted Mean	Verbal Description
1.I am aware that repairing items can extend their lifespan and reduce waste.	3.61	Strongly Agree
2. I often consider repairing broken items instead of discarding them.	3.53	Strongly Agree
3. My school offers workshops or resources for learning repair skills.	3.47	Strongly Agree
4. Repairing products is a common practice among my friends and family.	3.48	Strongly Agree
5. 5 There are accessible resources for repairing common household items in my community..	3.51	Strongly Agree
6. I believe that repairing is more environmentally friendly than buying new products.	3.50	Strongly Agree
7. My peers value repairing over replacing damaged items whenever possible.	3.50	Strongly Agree
8.Repair workshops are available in my community for fixing various items.	3.51	Strongly Agree
9. I feel confident in my ability to repair simple household goods when needed.	3.53	Strongly Agree
10. Repairing items is an important aspect of sustainable living.	3.55	Strongly Agree
Average	3.52	Strongly Agree

Table 6 respondents show a positive attitude toward repair practices. High weighted means like 3.54 for "My school promotes learning repair skills as part of its curriculum focused on sustainability education" and 3.56 for "Repairing should become an integral part within discussions surrounding sustainable living practices overall" indicate that repair is viewed as an important skill for sustainable living. The respondents also feel confident in their ability to repair simple household goods, with a weighted mean of 3.53 for "I feel confident enough tackling minor repairs around home without needing professional assistance most times now due experience gained overtime through practice alone." However, some areas show room for improvement, as evidenced by the statement "I have access to resources available online teaching individuals how they may repair common household goods easily" (3.46), which received a slightly lower mean. This suggests that while repair is valued, there could be more widespread access to resources or training on repairing items. With a total weighted mean of 3.52 and a standard deviation of 0.02, respondents show overall positive attitudes toward repair, but there is potential to expand repair knowledge and resources to a broader community level.

In Repairing, the highest weighted mean is 3.56, recorded in two statements: "I often encourage friends/family members interested enough into learning how they could fix things themselves instead buying new ones outrightly" and "Repairing should become an integral part within discussions surrounding sustainable living practices overall." This indicates strong advocacy for repair practices, supported by Wang et al. (2021), who emphasized the importance of community support in promoting repairs. The lowest weighted mean is 3.46 in the statement, "I have access to resources available online teaching individuals how they may repair common household goods easily." This suggests limited access to digital repair resources, as similarly noted by Priyadarshini and Abhilash (2020), who called for greater resource availability to support repair initiatives.

B. Practices

➢ *Recycling*

Table 7: Practices on Solid Waste Management in Terms of Recycling

As a student…..	Weighted Mean	Verbal Description
1. My school has effective recycling programs in place for students to participate in actively.	3.62	Strongly Agree
2. Recycling bins are conveniently located throughout my school or community areas.	3.61	Strongly Agree
3. I consistently recycle materials at home and encourage others to do the same.	3.53	Strongly Agree
4. My peers support and participate in recycling initiatives within our community.	3.51	Strongly Agree
5.My community provides sufficient information about proper recycling practices.	3.55	Strongly Agree
6.Recycling is a common practice among my friends and family members.	3.54	Strongly Agree
7.My school regularly educates students about the importance of recycling materials properly.	3.56	Strongly Agree
8.There are clear guidelines available for what can and cannot be recycled in my area.	3.52	Strongly Agree
9.My community organizes events to promote recycling awareness and	3.49	Strongly Agree

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participation.		
10. Recycling is integrated into our daily routines at school and home.	3.57	Strongly Agree
Average	**3.55**	**Strongly Agree**

The respondents show a solid commitment to recycling practices. High weighted means like 3.62 for the statement "My school has effective recycling programs in place for students to participate in actively" and 3.61 for "Recycling bins are conveniently located throughout my school or community areas" suggest that both institutional and community-level support plays a critical role in fostering recycling behavior. The weighted mean for "I consistently recycle materials at home and encourage others to do the same" (3.53) indicates a strong personal engagement with recycling, and the respondents feel confident in their recycling practices. With a total mean of 3.55 and a standard deviation of 0.02, it is clear that the respondents are highly aware and involved in recycling activities, both at home and within their school and community. However, despite the high levels of participation, there's still room for more widespread involvement, especially in promoting community-based events for recycling awareness, as reflected in the slightly lower mean for "My community organizes events to promote recycling awareness and participation" (3.49).

In this section, the highest weighted mean is 3.62, observed in the statement, "My school has effective recycling programs in place for students to participate in actively." This reflects a robust implementation of recycling programs in schools, aligning with findings by Priyadarshini and Abhilash (2020), who emphasize the importance of institutional support in fostering recycling behavior. The lowest weighted mean is 3.49, recorded in the statement, "My community organizes events to promote recycling awareness and participation." This highlights the need for more community-driven initiatives to enhance public engagement, consistent with Meyer (2021), who identified community events as critical for recycling advocacy.

- *Reusing*

Table 8: Practices on Solid Waste Management in Terms of Reusing

As a student…..	**Weighted Mean**	**Verbal Description**
1.My school encourages students to find creative ways to reuse materials effectively.	3.62	Strongly Agree
2. There are opportunities within my community for exchanging or donating reusable items.	3.56	Strongly Agree
3. Reusing materials is a common practice taught in our environmental education programs at school.	3.58	Strongly Agree
4.My friends often share ideas on how to reuse everyday items creatively.	3.56	Strongly Agree
5. Local organizations promote initiatives focused on reusing rather than discarding items altogether.	3.53	Strongly Agree
6. Reusable bags, containers, and other products are readily available in my community stores.	3.57	Strongly Agree
7. My family actively participates in reusing programs or events organized by local groups or schools.	3.50	Strongly Agree
8. Reusing is emphasized as a key component of sustainability within our community discussions and activities.	3.52	Strongly Agree
9.There are workshops available that teach skills related to reusing materials effectively within our area.	3.48	Strongly Agree
10.Reusing practices are commonly discussed during environmental education classes at my school.	3.54	Strongly Agree
Average	**3.55**	**Strongly Agree**

The responses again reflect a strong commitment to sustainable practices. Statements like "My school encourages students to find creative ways to reuse materials effectively" (3.62) and "There are opportunities within my community for exchanging or donating reusable items" (3.56) suggest that the respondents are actively involved in reusing materials and are supported by both educational and community structures. The high mean for "Reusing materials is a common practice taught in our environmental education programs at school" (3.58) also indicates that reuse is an integral part of students' education on sustainability. However, some variability can be seen in responses to statements like "There are workshops available that teach skills related to reusing materials effectively within our area" (3.48), suggesting that while reuse is promoted, more hands-on educational opportunities could further enhance engagement. With a total weighted mean of 3.55 and a standard deviation of 0.02, it is clear that reusing is well understood and practiced, but there is room for further encouragement through more interactive programs and workshops.

For Reusing, the highest weighted mean is 3.62, found in the statement, "My school encourages students to find creative ways to reuse materials effectively." This reflects the effectiveness of schools in promoting innovative reuse practices, supported by research from Wang et al. (2021), which highlights the role of education in driving reuse

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behavior. The lowest weighted mean is 3.48, seen in the statement, "There are workshops available that teach skills related to reusing materials effectively within our area." This suggests limited opportunities for practical learning in reuse, a gap also noted by Singh et al. (2019), who emphasized the importance of skill-based workshops in promoting sustainability.

- *Reducing*

Table 9: Practices on Solid Waste Management in terms of Reducing

As a student…..	Weighted Mean	Verbal Description
1. My school has initiatives aimed at reducing waste generation among students effectively implemented throughout the year ahead.	3.61	Strongly Agree
2.I actively participate in campaigns focused on reducing single-use plastics within my community.	3.49	Strongly Agree
3.My family encourages each other to adopt habits that minimize unnecessary consumption.	3.52	Strongly Agree
4. I feel informed about local events aimed at raising awareness regarding reduction strategies.	3.49	Strongly Agree
5. I am informed about the benefits of recycling for the environment.	3.53	Strongly Agree
6.My community organizes clean-up drives or similar activities aimed explicitly at promoting reduction efforts.	3.50	Strongly Agree
7. I believe educational institutions should prioritize teaching students about reduction techniques.	3.53	Strongly Agree
8. Local businesses support efforts aimed at reducing excess packaging by offering alternatives.	3.50	Strongly Agree
9. I have learned about composting as a method for reducing organic waste effectively.	3.53	Strongly Agree
10. Reducing overall consumption should be prioritized by everyone involved.	3.59	Strongly Agree
Average	**3.53**	**Strongly Agree**

The respondents exhibit a strong awareness of the need to reduce waste and consumption. Statements such as "My school has initiatives aimed at reducing waste generation among students effectively implemented throughout the year ahead" (3.61) and "Reducing overall consumption should be prioritized by everyone involved" (3.59) reflect a broad understanding of the importance of waste reduction. The respondents also report actively participating in reduction campaigns, with a weighted mean of 3.49 for "I actively participate in campaigns focused on reducing single-use plastics within my community," showing engagement in efforts to minimize waste at the community level. The statement "I feel informed about local events aimed at raising awareness regarding reduction strategies" (3.49) suggests there is a need for greater awareness programs. Despite the enthusiasm for reducing waste, the slightly lower mean for "I actively participate in campaigns focused on reducing single-use plastics within my community" shows that there may be room for improvement in mobilizing individuals to take more action in these efforts. The overall weighted mean of 3.53 and the standard deviation of 0.03 indicate a general consensus on the importance of waste reduction, but more could be done to encourage consistent participation in these initiatives.

In this part, the highest weighted mean is 3.61, attributed to the statement, "My school has initiatives aimed at reducing waste generation among students effectively implemented throughout the year ahead." This demonstrates a strong institutional emphasis on waste reduction, aligning with findings from García et al. (2020), which stress the importance of educational initiatives in fostering sustainable habits. The lowest weighted mean is 3.49, shared by two statements: "I actively participate in campaigns focused on reducing single-use plastics within my community" and "I feel informed about local events aimed at raising awareness regarding reduction strategies." This indicates a need for more effective community engagement and awareness-raising campaigns, a challenge echoed in research by Kim and Lee (2021).

- *Recovering*

Table 10: Practices on Solid Waste Management in Terms of Recovering

As a student…..	Weighted Mean	Verbal Description
1. My community has established programs dedicated solely towards recovering valuable resources from discarded materials.	3.63	Strongly Agree
2. I actively participate in initiatives focused on promoting recovery processes within our local area.	3.56	Strongly Agree
3. My school teaches us about various methods used for effective resource	3.60	Strongly Agree

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recovery.		
4. I believe energy recovery from waste plays an important role when it comes down to sustainability efforts.	3.56	Strongly Agree
5. My peers show interest when discussing innovative ways we could improve upon existing recovery practices.	3.53	Strongly Agree
6. I often volunteer during cleanup events where we focus specifically on recovering usable resources from trash piles.	3.56	Strongly Agree
7. Local authorities provide clear guidelines regarding how they handle recovered materials after collection.	3.54	Strongly Agree
8. I support policies encouraging businesses/organizations involved with resource recovery initiatives.	3.58	Strongly Agree
9.I feel knowledgeable enough regarding different types/methods utilized during successful material recoveries.	3.51	Strongly Agree
10.Recovery practices should be integrated into all aspects related towards solid waste management.	3.57	Strongly Agree
Average	**3.56**	**Strongly Agree**

Table 10 indicates a solid awareness of resource recovery and its importance in sustainability. The statement "My community has established programs dedicated solely towards recovering valuable resources from discarded materials" (3.63) received the highest mean in this section, suggesting a strong community-level infrastructure for resource recovery. Respondents also recognize the importance of energy recovery, with a weighted mean of 3.56 for "I believe energy recovery from waste plays an important role when it comes down to sustainability efforts." Participation in resource recovery activities is also evident, as shown by the weighted mean of 3.56 for "I often volunteer during cleanup events where we focus specifically on recovering usable resources from trash piles." Despite these positive trends, the statement "I feel knowledgeable enough regarding different types/methods utilized during successful material recoveries" (3.51) suggests a slight gap in knowledge or awareness regarding the specific methods of recovery. Overall, with a total weighted mean of 3.56 and a standard deviation of 0.02, respondents show a strong commitment to recovery practices, with slight areas for improvement in terms of awareness and active participation.

The highest weighted mean for Recovering is 3.63, recorded in the statement, "My community has established programs dedicated solely towards recovering valuable resources from discarded materials." This indicates strong community initiatives for recovery, similar to findings by Zhou et al. (2020), which highlight the role of structured recovery programs in reducing waste. The lowest weighted mean is 3.51, observed in the statement, "I feel knowledgeable enough regarding different types/methods utilized during successful material recoveries." This reflects a need for better dissemination of knowledge about recovery methods, consistent with findings by Huang and Wu (2019).

- *Repairing*

Table 11: Practices on Solid Waste Management in terms of Repairing

As a student….	Weighted Mean	Verbal Description
1.My school promotes learning repair skills as part of its curriculum focused on sustainability education.	3.54	Strongly Agree
2.I have access to resources available online teaching individuals how they may repair common household goods easily.	3.46	Strongly Agree
3.My family values fixing broken items rather than purchasing new replacements whenever feasible.	3.50	Strongly Agree
4.Repair workshops hosted by local organizations help teach practical skills related towards fixing various products.	3.53	Strongly Agree
5.I often encourage friends/family members interested enough into learning how they could fix things themselves instead buying new ones outrightly.	3.56	Strongly Agree
6. Repairing damaged goods extends their lifespan contributing positively towards reducing overall waste produced annually.	3.50	Strongly Agree
7. Community members frequently discuss benefits associated with repairing versus replacing damaged possessions entirely.	3.53	Strongly Agree
8. I feel confident enough tackling minor repairs around home without needing professional assistance most times now due experience gained overtime through practice alone.	3.50	Strongly Agree
9. Local businesses offer discounts/ incentives encouraging customers who choose repair options over replacements regularly.	3.53	Strongly Agree
10 Repairing should become an integral part within discussions surrounding	3.56	Strongly Agree

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sustainable living practices overall.		
Average	**3.52**	**Strongly Agree**

Table 11 illustrates the application of reflective practice in collaborative learning and its impact on students' academic performance in English. The first item, "I find reflective practices effective in improving collaboration," had a weighted mean of 3.61. Item 2, which addressed remembering events from the day, had a weighted mean of 3.57. Item 3, focusing on reflecting on collaborative experiences, had a weighted mean of 3.50, while Item 4 had a weighted mean of 3.54. Item 5, concerning participation in collaborative activities, had a weighted mean of 3.60. Item 6, "Reflective practices develop my collaborative skills," received the lowest weighted mean of 3.52. Items 7 and 10 had weighted means of 3.55. Item 8, "I encourage myself when I encounter barriers like lack

C. Relationship Between Awareness and Practices on Solid Waste Management

Table 12 presents the Pearson correlation between Awareness and Practices on Solid Waste Management. The table shows the mean values, correlation coefficient (r-value), p-value, and their respective verbal interpretations.

Table 12: Correlation between Awareness and Practices on Solid Waste Management

Variable	Mean	r-Value	p- Value	Decisions	Verbal Interpretation
Awareness	3.4445	0.7163	<.00001	Acceptable	Strong Positive Correlation
Practices	3.5419				

For Awareness, the mean score is 3.4445, with a Pearson r-value of 0.7163. This indicates a strong positive correlation between Awareness and Practices, as the r-value is close to 1, showing that as awareness increases, the practices regarding solid waste management tend to improve. The p-value is less than 0.00001, which is highly significant, suggesting that the correlation is statistically significant and not due to chance. The verbal interpretation of this result is "Acceptable," confirming the strength of the positive relationship between Awareness and Practices.

For Practices, the mean score is 3.5419, though no specific r-value is provided in the table. However, based on the provided correlation, it can be inferred that practices are strongly influenced by awareness.

In summary, the table illustrates a strong positive correlation between awareness of solid waste management and actual practices, indicating that greater awareness likely leads to better practices in waste management

IV. DISCUSSION

A. Students' Awareness of Solid Waste Management

The findings of this study demonstrate that students at Partida National High School exhibit varying levels of awareness regarding solid waste management, particularly in the principles of recycling, reusing, reducing, recovering, and repairing. The results indicate that while students recognize the importance of waste management in environmental conservation, gaps remain in their understanding of specific waste management strategies.

The study highlights that students have a strong awareness of recycling, particularly for common materials like paper, plastic bottles, and aluminum cans. However, knowledge about recycling complex materials such as electronic waste and mixed-material products remains limited. Similarly, while students acknowledge the benefits of reusing materials, their application of creative reusing strategies is minimal. The principle of reducing waste is widely recognized, yet its practical implementation varies among students, with inconsistent habits observed in reducing single-use plastics. The study also reveals that awareness of recovering and repairing resources is relatively low, with students showing limited understanding of composting, energy recovery, and repairing damaged items as alternatives to disposal. These findings suggest the need for enhanced education and initiatives to broaden students' knowledge and application of solid waste management principles.

B. Students' Practices in Solid Waste Management

The data indicates that while students demonstrate an awareness of solid waste management, their actual practices are inconsistent, influenced by accessibility, convenience, and institutional support. The study finds that students commonly engage in recycling activities, such as segregating waste and using designated bins, yet limitations in recycling facilities hinder consistent efforts. Similarly, students practice basic reusing habits, such as repurposing plastic containers and bags, but lack engagement in innovative or sustainable reuse strategies.

The findings also highlight a disparity between students' knowledge of reducing waste and their practical application of this principle. While many recognize the need to minimize single-use plastics, a significant number continue to rely on disposable products due to convenience. Additionally, recovery practices, such as composting and waste-to-energy initiatives, remain largely unpracticed due to a lack of resources and awareness. Repairing damaged items is the least practiced principle, with most students opting to replace broken objects rather than repair them, citing affordability and a lack of repair skills as key barriers. These findings underscore the need for stronger implementation strategies, accessibility to waste management facilities, and skill development programs to enhance students' solid waste management practices.

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C. Relationship Between Awareness and Practices in Solid Waste Management

The correlation analysis reveals a strong positive relationship between students' awareness and their solid waste management practices. Students with higher awareness levels tend to engage more in responsible waste management behaviors, such as recycling, reusing, and reducing waste. However, the study also emphasizes that awareness alone does not guarantee consistent practice. Factors such as convenience, institutional support, and available facilities significantly influence students' ability to apply their knowledge in daily life.

For instance, while students understand the environmental benefits of composting, the absence of composting facilities at school limits their ability to engage in this practice. Similarly, despite acknowledging the importance of repairing items, students often lack the tools and skills to perform repairs. These findings suggest that increasing awareness must be complemented by providing accessible resources and fostering an environment that encourages sustainable waste management practices. Strengthening educational programs, integrating hands-on activities, and improving infrastructure are essential steps toward bridging the gap between awareness and action in solid waste management.

V. CONCLUSIONS

Senior high school students demonstrate a high level of awareness regarding basic waste management principles, particularly recycling, reusing, and reducing. However, this awareness does not consistently translate into practical application, especially in more advanced practices like recovering and repairing waste. This highlights a critical gap between knowledge and action.

A key finding of the study is the presence of knowledge gaps in advanced waste management practices, suggesting the need for enhanced educational efforts to deepen students' understanding of recovery and repair strategies. Additionally, various barriers—such as limited access to facilities, lack of training, and a prevailing culture of convenience—significantly hinder students' ability to implement sustainable waste management behaviors.

Institutional support emerges as a crucial factor in fostering effective waste management practices. Schools and communities play a vital role in providing the necessary resources, such as recycling bins, repair workshops, and awareness campaigns, to encourage long-term behavioral change.

The strong correlation between awareness and practice underscores the importance of bridging the gap between knowledge and action. Thoughtful interventions, including structured educational programs and improved institutional support, can help students transition from awareness to consistent practice, fostering a more sustainable and responsible approach to waste management.

RECOMMENDATIONS

The following recommendations are offered to enhance the effectiveness of waste management practices among high school students:

Schools should prioritize integrating solid waste management principles into the curriculum through interactive learning modules, ensuring that students develop a comprehensive understanding of recycling, reusing, reducing, recovering, and repairing waste. Conducting seminars and workshops focused on addressing knowledge gaps, particularly in advanced waste recovery and repair techniques, will help bridge the gap between awareness and practice.

To improve waste management practices, schools should establish accessible facilities such as labeled recycling bins in key areas, composting systems for biodegradable waste, and repair workshops that teach students how to fix damaged items. Partnering with recycling centers and launching initiatives like school-wide reuse competitions and campaigns to minimize single-use plastics can further encourage sustainable behaviors.

Recognizing the critical link between awareness and practice, educators should implement project-based learning activities that allow students to apply theoretical knowledge to real-world waste management scenarios. Reward systems and action-based programs, such as "Clean and Green" campaigns, can be introduced to motivate students and reinforce long-term engagement in sustainable practices.

Institutional support plays a crucial role in fostering a culture of sustainability. Schools should collaborate with local government units and environmental organizations to provide additional waste management resources and opportunities for community engagement. Allocating resources for the establishment of repair centers, recycling programs, and eco-friendly initiatives will enhance students' ability to adopt sustainable waste management behaviors.

Finally, regular monitoring and evaluation should be conducted to assess students' awareness, track their waste management practices, and identify areas for improvement. Establishing feedback mechanisms will ensure continuous refinement of school-based waste management strategies, ultimately promoting a more sustainable and environmentally responsible student community.

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