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Awareness and Attitude toward the Implementation of Solid Waste Management Program in a Public Secondary School: Basis for Proposing a School-Based SWM Plan

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Abstract

Aim: The study aimed to assess the awareness, attitude, and implementation of the SWM program in a public secondary school in the Municipality of Candelaria, Quezon.
Methodology: The descriptive-correlational design was used for the study. Data were gathered from four hundred twenty-six (426) respondents encompassing school administrator, teaching and non-teaching personnel, and senior high school students of a public secondary school in the Municipality of Candelaria, Quezon through a 4-point Likert scale survey questionnaire. Analysis of data was undertaken by means of descriptive and inferential statistics.
Results: The overall mean of 3.47 with a standard deviation of 0.46 reveals that students and school employees are aware of various SWM practices. Also, the overall mean of 3.72 (SD=0.36) signifies that the respondents' pro-environmental attitude is very satisfactory. While the overall mean of 3.25 (SD=0.58) exhibits that school community members often practice minimizing waste generation, segregation at source, proper waste collection, and appropriate waste processing such as reusing and recycling. Further, awareness of SWM practices indicated in relevant laws, DepEd policies, and municipal ordinances and attitude have a significant relationship with waste generation, segregation, collection, and processing practices, all of which are significant at 0.01 level (2-tailed).
Conclusion: Respondents are aware of SWM practices as indicated in relevant laws, DepEd policies, and municipal ordinances. They also demonstrated strong agreement to statements signifying very satisfactory pro-environmental attitude. Additionally, minimizing waste generation, proper waste segregation, waste collection, and waste processing are often practiced by the school community members. Findings exhibited a significant relationship between awareness and attitude with the level of implementation of SWM program at the school level.

Keywords: awareness, pro-environmental attitude, school-based SWM plan, solid waste management, SWM practices

INTRODUCTION

Concern on the rapid rate of waste generation mainly attributed to population growth, enhanced quality of life, and progress in the economy is crucial now more than ever. Moreover, the management of this rapidly increasing amount of waste has become a significant global issue as it affects everyone. Regular glimpse in media devices constantly feeds us with updates about various environmental issues and the enduring battle to fight for the only planet suitable for life – Earth.

With a growing population, an increase of 19.8% is projected equating to 57, 579 tons of waste generated per day by the Environmental Management Bureau by 2019 (Mapa, 2021). Even worse, the Ocean Conservancy and McKinsey Center for Business and Environment (2015) evaluated that the Philippines ranked as the third-largest source of discarded plastic that ends up in the ocean at 2.7 million tons per year.

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Any garbage material generated from industrial, residential, and commercial activities that are discarded once considered useless and unwanted, except for hazardous, infectious, and contaminated waste, constitutes what is called solid waste (R.A. 9003, 2001). These are the things that we commonly throw out after considering that it has no further use such as leftover food, food packaging, paper, defective equipment, and other things. It becomes a never-ending series of utilizing natural resources to accommodate endless human needs then losing these resources thereafter when we throw them out thereby causing the accumulation of waste beyond what our natural environment can digest. This calls for urgent action at all levels of society because of the immense problems that it creates such as contamination of our oceans, exacerbation of air and land pollution, flooding caused by clogged canals and waterways, and harm to animals from unknowingly ingesting our waste (Ijjasz-Vasquez et al, 2018).

Generally, managing waste constitutes any effort to control solid waste materials such as its generation, storage, transfer, and disposal which is commonly undertaken to reduce their ill effects on human health, guarantee comfortable living conditions, and maintain the aesthetics of the environment as well as recover resources from them (Azuelo, 2016). Moreover, the effective implementation of solid waste management is supportive of the attainment of several SDGs such as SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), SDG 8 (Decent Work and Economic Growth), and SDG 14 (Life Below Water). While SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production) particularly target the substantial minimization of waste generation and developing awareness and knowledge of people on attaining progress that does not compromise the environment (United Nations, 2015).

In the Philippines, Republic Act No. 9003 (R.A. 9003) otherwise known as the Ecological Solid Waste Management Act of 2000 mandated prohibitions in negligent dumping waste matter in public places along with other stipulations endeavored at extensively managing waste. Locally, legislative efforts in managing municipal waste are evident through the passing of several ordinances since 1993 from setting provisions for regularly cleaning the surrounding and providing trash bins for proper waste disposal (Kautusang Pambayan Blg. 3, 1993), to enforcing segregation and encouraging the practice of recycling and reusing (Kautusang Pambayan Blg. 2003-03, 2003), and prohibiting the use of plastic bags on dry and wet goods and the use of styrofoam in the municipality of Candelaria, Quezon (Municipal Ordinance No. 066-2010 as amended by Municipal Ordinance No. 094-2013).

Additionally, the law declares that it is the policy of the State to guarantee public participation in the creation and execution of SWM initiatives, enforce legal provisions provided by the law, support research on SWM strategies, and foster awareness for our environment (R.A. 9003, 2021). Noting the important role of schools in advancing solid waste management, the Department of Education (DepEd) together with other agencies is mandated to aggressively incorporate ecological waste management in the school systems at all levels, emphasize the involvement of school staff and students in school-wide and nearby community waste management actions, and strengthen waste management content in the curricula (IRR of R.A. 9003, 2001). Equally, DepEd also recognizes the need to properly manage solid waste in schools to keep cleanliness, ensure health and safety, and afford a conducive space for the learning of students (DepEd Order No. 10, s. 2016, 2016).

Amidst all the ideal legislative measures and policies, unchanged habits and mindset hinder its full realization. Eighteen years following the enactment of R.A. 9003, the trash problem in the Philippines persist and data shows that local government units (LGUs), being the main implementer of the Act, continue to encounter difficulties in carrying out the mandates stated in this law (Gequinto, 2017; Tantuco, 2018). Willful ignorance and unmindful attitude are used as an excuse for inaction and the present condition in classrooms and public spaces in the municipality reflects the gap in the implementation of environmental laws and policies.

Available studies on solid waste management practices assessing awareness, attitude, and/or practices involved either households or educational institutions. However, most of the research in school-based SWM focused on universities predominantly with college students as respondents. An absence of a study delving on solid waste management practices among public secondary schools comprehensively involving school administrators and faculty, non-teaching personnel, and students particularly in the Philippine context was accounted more so the development of a School-based SWM Plan.

It is with this premise that the researcher proposed to assess the awareness, attitude, and implementation of solid waste management program to obtain reliable information and sector-specific data particularly on current waste generation, segregation, collection, and processing status in a public secondary school in the Municipality of Candelaria, Quezon, which served as the basis for crafting a School-based SWM Plan with the goal of minimizing its waste generation, strengthening the practice of segregating at source, setting up a systematic collection process, and reducing the amount of solid waste destined for disposal with increased reuse, recycling, composting, and other organic materials recycling methods through designed strategies and SWM systems in line with the overarching goal

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of the K to 12 Social Studies Curriculum (2016) of developing productive and compassionate citizens who have a deep sense of environmental stewardship and patriotism.

Research Questions

The study aimed to assess the awareness, attitude, and level of implementation of the SWM program in a public secondary school in the Municipality of Candelaria, Quezon which aided in proposing a School-based SWM Plan. Specifically, it sought to answer the following questions:

1. What is the level of respondents' awareness on SWM practices at the school level as indicated in:
   1.1 relevant laws;
   1.2 DepEd policies; and
   1.3 municipal ordinances?
2. What is the level of pro-environmental attitude of the respondents towards waste and its management?
3. What is the level of implementation of SWM program at the school level in terms of practicing:
   3.1 waste generation;
   3.2 waste segregation;
   3.3 waste collection; and
   3.4 waste processing?
4. Is there a significant relationship between the level of awareness and the level of implementation of SWM program at the school level?
5. Is there a significant relationship between the attitude and the level of implementation of SWM program at the school level?
6. What solid waste management plan can be proposed based on the findings of the study?

Hypothesis

Given the stated research problem, the following hypotheses were tested:
Hypothesis 1: There is no significant relationship between the level of awareness and the level of implementation of SWM program at the school level.
Hypothesis 2: There is no significant relationship between attitude and the level of implementation of SWM program at the school level.

METHODS

Research Design

The descriptive-correlational design was used for the study. With this, the researcher described the awareness, attitude, and level of implementation of SWM practices in the public secondary school. It is also nonexperimental research aimed to evaluate the statistical relationship between awareness and attitude toward solid waste management with the level of implementation of SWM practices at the school level. Results of the assessment served as the basis for crafting a School-based SWM Plan aimed at strengthening the capacity of public secondary schools to implement appropriate SWM practices.

Population and Sampling

Using the convenience sampling technique, one (1) public secondary school was chosen for the study and pilot the preparation of a School-based SWM Plan on account of convenience and accessibility. Data was gathered from four hundred twenty-six (426) respondents encompassing school administrator, teaching and non-teaching personnel, and SHS students of the public secondary school.

Instrument

The survey questionnaire comprises three parts. Part I is labeled Level of Awareness on SWM Practices as indicated in (A) Relevant Laws, (B) DepEd Policies, and (C) Municipal Ordinances. Statements used in the questionnaire were generally based on various legislations and policies on Solid Waste Management including Republic Act No. 9003, Municipal Ordinances enforced in Candelaria, Quezon, the United Nations' Sustainable Development Goals, and issuances of the Department of Education. Part II focused on Attitude Towards Waste and Its Management while Part III comprised statements measuring the Level of Implementation of SWM Program at the

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school level which is further subdivided into four categories namely (A) Waste Generation, (B) Waste Segregation, (C) Waste Collection, and (D) Waste Processing. Part II and Part III were adapted-modified from questionnaires of previous studies with similar variables to fit the objectives of the current study. Specifically, Part II is anchored on studies of Galarpe and Heyasa (2017) and Amaba et al. (2018) while Part III is anchored on studies of Gantang (2014), Paghasian (2017), and Amaba et al. (2018).

Data Collection

Seeking approval and endorsement through formal communication letters were primarily sought from authorities concerned to conduct the study and initially present the proposal of crafting a School-based SWM Plan for public secondary schools of the municipality. Panel members and adviser were provided with the initial draft of the research instrument for critiquing and remarks. Once approved, it was subjected to external validation by a group of experts who evaluated the relevance, clarity, and appropriateness of each item. Revisions were made based on the provided remarks. Reliability of the research questionnaire was established through pilot testing. After applying the necessary amendments, the final copy of the research instrument was produced. Subsequently, data gathering commenced with the distribution of survey questionnaire to respondents.

Treatment of Data

In analyzing the data, appropriate descriptive and inferential statistics were applied. Particularly, mean was used to determine the level of awareness of SWM practices, attitude towards waste and its management, and level of implementation of solid waste management program of a public secondary school in the municipality. Additionally, the standard deviation of the mentioned indicators was also presented to show how dispersed the data is relative to the computed mean. Pearson Product-Moment Correlation, on the other hand, was utilized to measure the strength of the association between (a) awareness of SWM policies and practices and the level of implementation of SWM program and (b) the attitude towards waste and its management and the level of implementation of SWM program.

Ethical Considerations

For ethical considerations, this research was conducted in a systematic, logical, empirical, reductive, and replicable fashion. The researcher informed and discussed the study with the respondents and solicited their participation through an Informed Consent form. To observe confidentiality, the anonymity of the respondents was maintained. Further, no harm was done to the respondents.

RESULTS and DISCUSSION

Respondents' Awareness of SWM Practices at the School Level

Table 1 shows the summary of the respondents' awareness of SWM practices at the school level.

Table 1.
Summary Table on Respondents' Awareness of SWM Practices at the School Level

Indicators	Mean	SD	Verbal Interpretation
Relevant Laws	3.38	0.48	Aware
DepEd Policies	3.68	0.39	Fully Aware
Municipal Ordinances	3.34	0.52	Aware
Overall	**3.47**	**0.46**	**Aware**

Legend: 3.50 – 4.00 (Fully Aware); 2.50 – 3.49 (Aware); 1.50 – 2.49 (Slightly Aware); 1.00 – 1.49 (Not Aware)

With mean scores falling within the mean range of 2.50-3.49, it shows that respondents are aware of SWM practices as indicated in relevant laws (Mean=3.38, SD=0.48) and municipal ordinances (Mean=3.34, SD=0.52). While a mean score of 3.68 (SD=0.39) is recorded for DepEd policies which indicates that they are fully aware of SWM practices indicated in policies issued by the department. With DepEd having direct supervision over the school,

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full awareness is expected as educational institutions are required to implement these policies in their campuses. The overall mean of 3.47 with a standard deviation of 0.46 reveals that students and school employees are aware of various SWM practices.

This indicates that members of the school community are equipped with moderate knowledge of SWM policies which is vital to putting them into practice and positively contributing to better management of solid waste. It is expected that this awareness increases the likelihood of practicing SWM policies as it will drive and motivate both the school employees and students to follow the policies and prevent them from doing prohibited acts and violating the mentioned legislation (Amaba et al., 2018; Paghasian, 2017; Bautista, 2019; Madrigal & Oracion, 2017; Cando et al., 2022).

Additionally, it was discovered that the current SHS students who were respondents of the study have not attended any assembly on waste management. This is believed to have hindered the respondents from becoming fully aware of the policies on solid waste management as indicated in relevant laws and municipal ordinances.

Active information, education, and communication campaigns are necessary to develop awareness and, thereby, form positive attitudes among individuals toward waste and its management (Azuelo et al., 2016; Gantang, 2014; Paghasian, 2017; Bautista, 2019; Madrigal & Oracion, 2017; Cando et al., 2022; Sarker et al., 2012; Donmez-Turan and Kiliclar, 2021).

Pro-Environmental Attitude of Respondents towards Waste and Its Management

Table 2 displays the respondent's attitude toward waste and its management. Environmental attitude refers to the feelings and beliefs that an individual has towards the environment which can motivate one to participate in its protection and conservation (Dung et al., 2017; Debrah et al., 2021).

Table 2.
Respondent's Pro-environmental Attitude towards Waste and Its Management

	tements	Mean	SD	Verbal Interpretation
1.	Improper waste disposal is a threat to the environment.	3.79	0.46	Very Satisfactory
2.	Solid waste management is the responsibility of every individual.	3.80	0.45	Very Satisfactory
3.	Waste segregation in school is beneficial to the whole community.	3.77	0.46	Very Satisfactory
4.	Open burning and improper disposal of waste cause health risks.	3.69	0.54	Very Satisfactory
5.	Practicing the 3R – reduce, reuse, recycle – in schools is important to solid waste management.	3.77	0.49	Very Satisfactory
6.	Discipline is a vital part of ensuring the success of implementing solid waste management.	3.82	0.42	Very Satisfactory
7.	The school plays an important role in educating and strengthening SWM practices in the community.	3.72	0.46	Very Satisfactory
8.	I am responsible for the generation of solid waste.	3.54	0.56	Very Satisfactory
9.	I have the responsibility to proper waste management.	3.67	0.51	Very Satisfactory
10.	I play a vital role in the success of the school's solid waste management program.	3.56	0.57	Very Satisfactory
	Overall	**3.72**	**0.36**	**Very Satisfactory**

Legend: 3.50 – 4.00 (Very Satisfactory); 2.50 – 3.49 (Satisfactory); 1.50 – 2.49 (Fair); 1.00 – 1.49 (Poor)

The data reveals that pro-environmental attitude among respondents is very satisfactory as evidenced by mean scores in the ten statements which fall under the 3.50 – 4.00 mean range. Consistently, the overall mean of

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3.72 (SD=0.36) signifies that the respondents' pro-environmental attitude is very satisfactory. Results indicate a shared consciousness of both school employees and students of their responsibility as individuals and as a community on the management of waste. Being conscious and having awareness of the waste problem as well the available policies and practices that can be done to contribute to its resolution is believed to be the reason for this positive attitude of the respondents (Dung et al., 2017; Debrah et al., 2021). Additionally, the right attitude can motivate individuals to perform appropriate waste management practices (Madrigal & Oracion, 2017). Thus, data guides policymakers and planners on the possible choices and decision-making process of respondents and opportunities for action in determining suitable SWM strategies as one assesses attitude toward SWM (Swesi et al., 2017).

Level of Implementation of SWM Program at the School Level

Table 3 summarizes the respondents' level of implementation of SWM program in terms of waste generation, segregation, collection, and processing practices.

Table 3.
Summary Table on the Respondents' Level of Implementation of SWM Program at the School Level

Indicators	Mean	SD	Verbal Interpretation
Waste Generation	3.21	0.57	Often Implemented
Waste Segregation	3.24	0.63	Often Implemented
Waste Collection	3.30	0.54	Often Implemented
Waste Processing	3.24	0.57	Often Implemented
Overall	**3.25**	**0.58**	**Often Implemented**

Legend: 3.50 – 4.00 (Always Implemented); 2.50 – 3.49 (Often Implemented); 1.50 – 2.49 (Seldom Implemented); 1.00 – 1.49 (Never Implemented)

All of the mean scores for the four variables are within the range of 2.50-3.49 which translates that members of the school community often practice minimizing waste generation, segregation at source, proper waste collection, and appropriate waste processing such as reusing and recycling.

The study focused on the relevant elements applicable to the school experience, i.e. waste generation, waste segregation, waste collection, and waste processing practices, viewing the school as a source with the capacity to efficiently handle and process their generated waste thereby contributing to a more efficient and effective waste management in the municipality which is in line with the objective of implementing an Integrated Solid Waste Management System (ISWMS) in the Philippines (R.A. 9003, 2001). Considering that the other two elements, i.e. waste transport and final disposal, are more of a concern of the local government units, the said components were not assessed in the study inasmuch as it does not compromise the evaluation of the level of implementation of the SWM program in the school and the aim of an ISWMS to optimize competent use of resources and reduction of the amount of waste ending up in the final disposal site through environmentally sound practices continues to be regarded.

Studies concerning SWM practices in the school, such as Gantang (2014), Paghasian (2017), and Bautista (2019), predominantly assessed similar variables. With the objective of providing baseline data for crafting a School-based Solid Waste Management Plan, assessing the four components out of the six basic elements of waste management system aims to show how solid waste management is practiced at the school level.

Test of Relationship Between Awareness and Implementation of SWM Program at the School Level

Table 4 exhibits the relationship between the level of awareness and the level of implementation of SWM practices at the school level. In general, awareness of SWM practices indicated in relevant laws, DepEd policies, and municipal ordinances have a significant relationship with waste generation, segregation, collection, and processing

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practices, all of which are significant at 0.01 level (2-tailed). This implies that having awareness of SWM policies increases the likelihood of putting them into practice.

Table 4.
Correlation between Awareness and the Level of Implementation of SWM Program at the School Level

Awareness of Solid Waste Manage-ment Practices	**School-Level SWM Implementation**			
	Waste Generation	Waste Segregation	Waste Collection	Waste Processing
Relevant Laws	.478**	.536**	.398**	.480**
DepEd policies	.135**	.203**	.148**	.188**
Municipal Ordinances	.462**	.392**	.371**	.406**

**. Correlation is significant at the 0.01 level (2-tailed).

Amaba et al., (2018), Paghasian (2017), Bautista (2019), Madrigal and Oracion (2017), and Desa et al. (2012) confirmed this finding in their respective research and added that it is vital to ensure that continued education and awareness-raising activities be conducted to secure high awareness and thereby gain the support and participation of members of the school community in practicing efficient solid waste management. Further, these efforts are enforcement of the provisions of Republic Act No. 9003 which places the responsibility on academic institutions to foster environmental consciousness.

However, apart from awareness-building, opportunities to actively participate in meaningful activities that would sensitize people on the waste problem and its consequences could more likely change their poor waste management practices (Laohasiriwong et al.,2010; Twumasi, 2017; Ifegbesan, 2010). With this, awareness remains a vital building block in developing SWM practices of minimizing waste generation, waste segregation, proper collection, and responsible waste processing including reusing, recycling, and composting. This encourages local government units to target schools for their information and education campaigns and cascade existing programs on waste management to gain partners and advocates for environmental protection and conservation.

Test of Relationship Between Attitude and Implementation of SWM Program at the School Level

Table 5 reveals that there is a significant relationship between attitude and the level of implementation of SWM program at the school level in terms of waste generation, segregation, collection, and processing practices, all of which are significant at 0.01 level (2-tailed). This means that pro-environmental attitude increases the likelihood of students and school employees implementing the SWM program at the school level by practicing waste generation, waste segregation, waste collection, and waste processing.

Table 5.
Correlation between Attitude and the Level of Implementation of SWM Program at the School Level

Attitude towards Waste and Its Management	**School-Level SWM Implementation**			
	Waste Generation	Waste Segregation	Waste Collection	Waste Processing
	.271**	.329**	.240**	.324**

**. Correlation is significant at the 0.01 level (2-tailed).

Madrigal and Oracion (2017) and Debrah et al. (2021) supports this premise and found environmental attitude to influence solid waste management. In contradiction, McAllister (2015) pointed an attitude-behavior gap relative to waste management explaining the inconsistency between an individual's attitude and action. To bridge this gap, education is key to actualize pro-environmental attitude into practice (Ma, 2016). Additionally, knowledge shapes attitude and these two together are considered fundamental components of practice (Ahmad et al., 2015). To ensure the formation of pro-environmental attitude, schools are expected to enforce SWM legislation of promoting environmental education and awareness.

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Proposed School-based Solid Waste Management Plan

Deemed vital to a successful solid waste management at the school level is the awareness and positive attitude of the members of the school community. Thus, information, education, and communication strategies will be a central part of the plan to solicit their relevant participation as pro-environmental advocates who practice desirable solid waste management habits.

Core messages of the IEC Strategy shall include the following: SWM is mandated by law; Disasters can be avoided if we properly manage our waste; It is vital to recover and divert waste; Proper management of waste can generate income; Your support is vital to the success of the SWM efforts in our municipality; and Let us cooperate to achieve a clean environment.

The School-based SWM Plan addresses the generated biodegradable, recyclable, and residual waste which composes the bulk of waste in the school. Collaboration of the school with the barangay, as well as the municipal government, is also identified as among the key practices to strengthen and consolidate SWM efforts thereby creating a more positive impact in the municipality. Efforts in reducing, reusing, and recycling waste supported by appropriate mechanisms of proper waste segregation and collection are included in the proposed SWM plan. Additionally, composting will be undertaken to capacitate the school in processing its biodegradable waste as part of its contribution to reducing the waste to be handled by the barangay.

With the identified strategies, it is expected that the output of the SWM management of the school includes organic fertilizer from composting, income generation from segregating, collecting, and recycling, and beneficial products from recycling and reusing waste.

The following table is an excerpt of the Proposed School-based SWM Plan particularly a part of the Plan Implementation for the SWM at a public secondary school in the municipality.

Table 6.
Part of the Plan Implementation for the Solid Waste Management (SWM) at a Public Secondary School.

SWM System	Activities	Objectives	Key Actors
Reduction of Waste Generation	Implement Anti-Plastic Ordinance	• to follow the mandates of the legislation • to reduce plastic waste generation	School Administrator Canteen Managers
	Prohibit Disposable Eating Utensils	• to reduce plastic waste generation • to identify eco-friendly alternatives	School Administrator Canteen Managers Class Advisers
	Enforce DepEd Order No. 13, s. 2017 banning junk foods in public schools	• to reduce plastic waste generation	School Administrator Canteen Managers
	Conserve and maximize writing materials	• to practice reusing resources • to reduce paper waste generation	Class Adviser
	Make Your Own Eco-Bag Campaign	• to reduce plastic waste generation • to promote eco-friendly alternatives	TLE Teachers
	IEC Campaign on Waste Reduction	• to raise awareness on the impact of excessive waste generation and the importance of contributing to minimizing waste • to promote reducing and reusing SWM practices • to develop a positive attitude towards each individual's responsibility to reduce waste generation	School Administrator YES-O Advisers and Officers SSC Advisers and Officers LGU-Candelaria, Quezon
Waste Segregation	Enforce Kautusang Pambayan Blg. 2003-03, s.2003	• to follow the mandates of the legislation • to promote segregation at source	School Administrator Class Adviser

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			Class Officers School Eco-Patrols
	Remodel School MRF	• to promote and improve waste recovery and diversion efforts in the school	School Administrator LGU-Candelaria, Quezon
	Labeling of Waste Bins	• to promote awareness of segregation by type of waste	School Administrator Class Advisers Class Officers SSC Advisers and Officers YES-O Advisers and Officers
	School Eco-Patrols	• to monitor segregation practices in classrooms and the DPCNHS campus	School Administrator YES-O Advisers and Officers SSC Advisers and Officers Class Officers Class Adviser
	DPCNHS Star Rewards: Best Waste Segregation Practice	• to motivate the students to segregate their waste • to incentivize practicing waste segregation • to recognize waste segregation efforts of the class	School Administrator YES-O Advisers and Officers SSC Advisers and Officers
	IEC Campaign on Waste Segregation	• to raise awareness on the impact of mixed garbage to the success of SWM • to promote segregation at the source • to capacitate members of the school community to practice segregating waste by type/category	School Administrator YES-O Advisers and Officers SSC Advisers and Officers LGU-Candelaria, Quezon
Waste Collection	Collection Schedule per Type of Waste	• to systematize waste collection • to ensure timely and regular waste collection	All Members of the School Community
	Procurement of Wheeled Waste Bins	• to aid in waste collection • to promote segregated waste collection	School Administrator
	Collaboration with the Barangay and LGU-Candelaria, Quezon for Scheduled and Regular Collection of Waste	• to promote segregated waste collection • to ensure collection of waste by appropriate authorities • to gain the support of the local government in the SWM initiatives of the school	School Administrator Barangay Mangilag Norte LGU-Candelaria, Quezon
Waste Processing	IEC on Recycling, Reusing, and Composting Initiatives	• to raise awareness of appropriate SWM practices • to promote waste recovery and diversion	School Administrator YES-O Advisers and Officers

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	• to capacitate members of the school community to practice the 3Rs and composting	SSC Advisers and Officers LGU-Candelaria, Quezon
School Composting Initiative	• to responsibly process biodegradable waste generated in the school • to produce fertilizer for nourishing the soil for the Gulayan sa Paaralan Project in the school • to promote diversion of waste ending in the municipal landfill	School Administrator YES-O Advisers and Officers SSC Advisers and Officers TLE and Science Teachers Canteen Manager LGU-Candelaria, Quezon
Recycling Initiatives : Gulayan sa Paaralan Garden Pots and Frames	• to promote recycling of plastic waste • to contribute to the waste recovery and diversion efforts in the municipality	School Administrator YES-O Advisers and Officers SSC Advisers and Officers Class Advisers LGU-Candelaria, Quezon
YES-O Income-generating Project for Plastic Bottles	• to directly involve student leaders in SWM initiatives of the school • to promote recycling of plastic waste • to contribute to the waste recovery and diversion efforts in the municipality	School Administrator YES-O Advisers and Officers Class Officers Class Adviser
SSC Income-generating Project for Used Paper	• to directly involve student leaders in SWM initiatives of the school • to promote recycling of paper waste • to contribute to the waste recovery and diversion efforts in the municipality	School Administrator SSC Advisers and Officers Class Officers Class Adviser
Participation in the Basu-raffle Program of LGU-Candelaria, Quezon	• to promote waste recovery and diversion • to incentivize practicing segregation, particularly, of residual waste	School Administrator YES-O Advisers and Officers SSC Advisers and Officers LGU-Candelaria, Quezon

Summary, Conclusions, and Recommendations

The study reveals that the members of the school community are aware of the SWM practices indicated in relevant laws and municipal ordinances while they are fully aware of the SWM practices indicated in DepEd policies. This was attributed to the direct involvement of the members of the school community in the implementation of policies issued by the Department of Education. Additionally, respondents expressed strong agreement with all indicators signifying a very satisfactory pro-environmental attitude. It was also exhibited that members of the school community often practice minimizing waste generation, waste segregation, proper waste collection, and waste processing.

Results of the inferential statistics revealed that awareness of solid waste management practices as indicated in relevant laws, DepEd policies, and municipal ordinances has a significant relationship with the level of implementation of SWM program in terms of waste generation, waste segregation, waste collection, and waste processing practices. Continuing education and information campaign is an integral strategy to ensure sustainable implementation of solid waste management in the country (R.A. 9003, 2001). Therefore, it is crucial to educate the public and raise awareness on solid waste management to secure support and participation to environmental actions (Bautista, 2019; McAllister, 2015; Nolasco et al., 2019). Accordingly, it is suggested that the local government unit as well as the schools be able to intensify solid waste management campaign drives including Seminar-Workshops to

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raise awareness and develop the right attitude to become advocates of environmental protection and conservation. It is also highly recommendable that teachers continue integrating environmental concepts in their classes and become advocates and models of desirable SWM habits.

There was also a significant relationship between attitude and the level of implementation of SWM program in terms of waste generation, waste segregation, waste collection, and waste processing practices. Makakalikasan is considered a core value of the Department of Education. With this, it is expected that schools foster environmental awareness and action towards the formation of pro-environmental attitude of the students. Reason for the inconsistency between awareness and attitude is pointed to the inability of students to understand their roles and responsibilities in environmental protection (Desa et al., 2012). Thus, instilling among the members of the school community that each individual is responsible for the waste that we generate and its impacts to the environment is vital to gain shared accountability and responsibility in its management. With this, the schools are encouraged to empower and support student organizations to continue spearheading campaigns that require the direct involvement and participation of the students and school employees in promoting waste management strategies such as waste minimization, segregation, recycling, reusing, and composting. It is also a good practice that school administrators continue to champion environmental protection and conservation in the school and support efforts and initiatives that raise awareness and develop desirable attitudes toward proper solid waste management and a clean and green school.

Findings of the study affirmed the crucial role of the school as a center of learning in raising awareness and forming the right attitude to capacitate its members to practice proper management of waste and contribute to alleviating the complex solid waste problem. The school-based SWM Plan designed to cater to the specific needs and conditions in the school and sustain its SWM efforts may be implemented. The schools may also undertake the establishment of a functional Materials Recovery Facility to further encourages the sorting and processing of waste to support the existing SWM income-generating initiative of the school and help in diverting waste thereby prolonging the life of the landfill in the municipality. Further, initiating a partnership with the local government unit and the schools may be carried out to collaboratively develop innovative strategies and tackle waste management challenges. One of the feasible products of this partnership is the establishment of a compost pit to process the biodegradable waste of the school.

Future studies may be conducted to further distinguish the awareness, attitude, and level of implementation of SWM program among the different members of the school community. Also, the limited studies on solid waste management offer opportunities for future researchers to explore issues related to the topic using the social science lens.

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