Implementation of Solid Waste Management: Basis for Enhancement

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Abstract

This study aimed to determine the pupils' level of capacities on solid waste management as to knowledge and attitude, pupils' level of Implementation of Solid Waste Management in terms of Segragation, Waste reduction, Waste recycling and ReUse and Waste Disposal and find the relationship between pupils' capacities and level of implementation of solid waste management. It was conducted at Gusa Elementary School of Cagayan de Oro City Division among the pupil-respondents (n=324) based on the Slovin's Formula computation. This study used researcher-made questionnaire that measures the pupils' capacities and level of implementation of solid waste management. The study used the statistical treatment of Mean, Standard Deviation, and Pearson product moment correlation coefficient (Pearson r) to answer the statements of the problems. Results revealed that pupils' capacities and implementation on Solid Waste Management (SWM) are at Positive level. It has a significant relationship. Pupils have high positive level on knowledge capacity and Waste Reduction on the implementation of SWM. School community including stakeholders are encouraged to continue to employ practices policies and provide appropriate materials, that would encourage everyone to segregate, recycle and reuse.

Keywords: Capacity, Knowledge, Attitude, Segregation, Solid Waste Management

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1. Introduction

Fast growth of the human population coupled with rapid industrialization and urbanization has triggered enormous waste production. The situation is devastating in rural areas where there is a dearth of scientific waste management strategies, mostly in the context of underdeveloped and developing countries. Solid Waste Management (SWM) is a critical environmental problem with direct effects on both environments: it can be in the air, water, and soil, and public health. The increase in waste generation across the world greatly complicates proper waste management activities. Any non-liquid waste created by individuals, households, small businesses, or institutions outside of the waste generated within cities is referred to as Solid Waste (SW) and the uncontrolled disposal of SW may affect public health and the environment as well.

The rapid growth in urban populations, economies, and power consumption in developing countries, combined with the failure of institutional authorities responsible for city planning, road works, SWM, and the environment to execute their core functional duties, has led to rampant SW generation. SWM plays a vital role in minimizing the impacts faced by municipal and rural areas due to increasing urbanization. It has become a major environmental challenge in developing countries due to the economic growth and the acceleration of consumption, which caused an expansion in SW generation. SWM systems in most cities of lower-middle income countries are underachieving their goals, underperforming, and originating adverse sustainability effects in urban growth and development (Derilo, 2021).

Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000) defined solid waste as all discarded household, commercial waste, non-hazardous institutional and industrial waste, street sweepings, construction debris, agriculture waste, and other non-hazardous/non-toxic solid waste. It is also evident that in other places, solid waste production is increasing. According to World Bank (2019), there will be an increase

on waste generation annually all over the globe by 70% from 2.01 billion tons in 2016 to 3.40 billion tons by 2050. Due to this, Philippines was considered as world's leading plastic polluters (WWF-Philippines, 2018). In addition, poor management of solid waste may cause health hazards to inhabitants, environmental problems such as water and soil contamination, air pollution and flooding and other socio-economic problems (Molina, 2021).

In response to the challenge, San Juan (2019) revealed that participation of community members on solid waste management program depends on the action taken by their leaders or officials. The absence of any of the resources will cause solid waste management program failure. Thus, the community members will be unsatisfied (Molina, 2021). Aside from these, mass cooperation and active participation is also necessary. Therefore, educating people through information dissemination on how to handle produced solid waste has become essential (Nolasco et al, 2019). However, poor information dissemination strategy on solid waste management will make the public less aware and less participative on the program. For instance, Dela Cruz (2020) revealed that in a certain community, solid waste management program is moderately implemented. Thus, section 55 of R.A. No. 9003 mandated Department of Education (DepEd), Commission on Higher Education (CHED) and other national agencies to carry continuing education and information dissemination program on solid waste management. The education and information dissemination should focus on a.) develop public awareness on the ill – effects and community – based solution to the solid waste problem; b.) provide feasible activities which will have greatest impact on solid waste problem; and c.) encourage the public to patronize environmentally friendly products. Furthermore, R.A. No. 9512 (Environmental Awareness and Education Act of 2008) requires the mentioned agencies to integrate environmental education in the school curricula at all levels, whether public or private schools. More so, it encourages the tertiary education through National Service Training Program to conduct activities but not limited to tree planting; waste minimization, segregation, recycling and composting; freshwater and marine conservation; forest management and conservation; relevant livelihood opportunities and economic benefits; and other such programs and undertakings to aid the implementation of different environmental protection laws.

Formal education for sustainable development is necessary at all levels of education to sustain social and environmental challenges in emerging nations and has the power to bring about a complete societal transition. Teachers with the necessary knowledge, attitude, abilities, and inventiveness are needed to improve the teaching of environmental sustainability or waste management sustainability. In light of this, this project examined how formal environmental education in schools might support SWM in low- and middle-income countries in moving toward cleaner production (CP). It is known that developing countries have not had a similar systematic review done in this area. 391 review papers have been published in this field, according to a search result in the Science Direct database (2000-2020). However, no research has linked formal schooling to SWM in any of these trials. The researcher was interested in investigating implementation of solid waste management: basis for enhancement in Gusa Elementary School.

This research was anchored to DepEd Order No. 5, s. 2014 – Implementing Guidelines on the Integration of Gulayan sa Paaralan, Solid Waste Management (SWM) and Tree Planting under the National Greening Program (NGP). These guidelines integrate the gulayan sa paaralan, ecological solid waste management and tree growing and caring as key components to attain the goals of DepEd on poverty reduction, food security, biodiversity conservation and climate change mitigation and adaptation. All other programs and projects related therein shall be integrated under NGP. The NGP shall be implemented in all public elementary schools nationwide by practicing waste management principle such as minimization, segregation, reduction, recycling, re-use and composting.

Management of Solid waste is one of the greater challenges for development all over the world. It is not only because SWM impacts the environment or health, but poor implementation of SWM hinders the nation's progress towards Sustainable Development (SD). Accordingly, there is a need for more comprehensive strategies for SWM within development processes. It is important to improve SWM for Sustainable Development through environmental conservation. The conceptual issues of this study included

the SWM practices to mitigate its impact on environmental and socio-economic development, the perception of the people about SWM, and assess the impact of solid waste management on the environment and sustainable development. Furthermore, the study focused on SWM not only as a government responsibility. It should also be done by every individual, since the waste is produced from school. These issues therefore served as part of the conceptual framework for the study of Solid Waste Management for Sustainable Development in Gusa ES.

SWM is a solid waste management planning framework. ISWM stands for Integrated Solid Waste Management. An effective ISWM system examines how to reduce, recycle, and manage solid waste to protect human and environmental health. Integrated Solid Waste Management uses local demands and conditions to identify and combine the most appropriate waste management strategies. The major Integrated Solid Waste Management operations include waste prevention, recycling and composting, and landfill design, construction, and management. Solid waste management is one of the world's greatest development challenges. Not only does poor solid waste management damage the environment and health, but it also inhibits the nation's progress towards Sustainable Development (SD). Schools are among the major garbage generators in any city or country. Paper makes up at least 40% of the normal school trash stream. Thus, more comprehensive solid waste management solutions within development processes are required. Solid waste management must be improved for Sustainable Development

2. Methodology

The study's design used a descriptive - correlational research design to verify hypothesis relating to the current situation in order to clarify it. This method is adapted it can be utilized to investigate new problems and questions that arose during the study. This is a non-experimental study of the significance of the variables with the help of statistical analysis.

A descriptive correlational research design was used in this study that aims to describe the variables and the relationships that occur naturally between and among them. Since it is descriptive, it will help gather information about the present existing condition. Correlational research is carried out to measure two variables. The goal of this design is to investigate relationships between variables without the research controlling or manipulating any of them (Mondina, 2021). Descriptive statistics such as mean and standard deviation were utilized to describe the variables of the study. In addition, Pearson Product Moment Correlation Coefficient or Pearson (r) was used to determine the significant relationship between the Independent and Dependent variables of the study.

3. Results and Discussions

Problem 1. What is the pupils' level of capacities on Solid Waste Management (SWM) in terms of:
  1. 1 Knowledge; and
  1.2 Attitude?

Table 1
Overall Pupils' Capacities on Implementation of SWM

Variables	Mean	SD	Description	Interpretation
Knowledge	3.24	0.93	Agree	Positive
Attitude	3.26	0.87	Strongly Agree	Highly Positive
Overall Mean	**3.25**	**0.90**	**Agree**	**Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

Table 1 discloses the Overall Pupils' Capacities on Implementation of SWM. It has an overall Mean of 3.25 with SD=0.90 which is described as Agree and interpreted as Positive Level. This means that the

pupils' capacity on the implementation of solid waste management program is at Positive Level. This further means that the pupils are properly equiped with the skills, knowledge and concepts necessary to implement SWM. Nabor and Dela Cruz (2022) claimed that implementation of SWM in the Philippines became part of the priorities as due to industrialization and rapid growth of population, waste disposal becomes a problem as it is one of the causes of immediate floods specially in urban areas.

Attitude has an Overall Mean of 3.26 with SD of 0.87 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils were able to develop Very high Level of attitude towards the implementation of SWM. Their attitude towards participating and doing SWM related activities are very high as they know its importance to the environment and the future as well. Romeo (2020) claimed that attitude towards solid waste management program is one factor that should also be given attention by educators. The learnersrealized the importance and impact of the program for them to appreciate and perform the necessary activities without hesitation or second thoughts.

Knowledge has an Overall Mean of 3.24 with SD of 0.93 which is described as Agree and interpreted as Positive Level. This means that the pupils are able to acquire positive level of knowledge towards the SWM program. The pupils are confident that they can do the things necessary in the implementation of the program with the assitance of adults like teachers and parents knowing that they are still minors. Nabor and Dela Cruz (2022) stated that information are now available as integration of some of the SWM concepts are in various topics in different subjects. Teachers can take advantage of the knowldege the learners have, considering its importance and benefits. Knowledge that is not put into actions can be easily forgotten. Thus, it must be backed up with appropriate set of activities as well.

Problem 2. What is the pupils' level of Implementation of Solid Waste Management in terms of:
    2.1 Segregation;
    2.2 Waste reduction;
    2.3 Waste recycling and ReUsing, and
    2.4 Waste Disposal?

Table 2 illustrates the Pupils' Level of Implementation of SWM on Segregation. It has an Overall Mean of 3.22 with SD of 0.91 which is described as Agree and interpreted as Positive Level. This means that the pupils have Positive Level of implementation on segregating their waste or garbage. The pupils know that importance of segregating waste or garbage to help save the environment and to minimize dirt and pollution. This is a great development considering that RA 9003 has been in effect for more than 20 years, but the nation is still having management problems. There is the issue of the general people participating in SWM initiatives passively. While barangays are significantly reliant on cities and municipal governments, communities are passive. In terms of local discourse, decision-making, involvement, and compliance in solid waste management operations, the local populace is not making a contribution.The direction of institutions and policy must also be coordinated. All sectors must adhere to the policy and determine whether it is still appropriate and applicable or if other solutions are needed (PanayNews.net, 2021).

In the same table, the indicator , I practice proper waste segregation in school like the way we are practicing at home, has the Highest Mean of 3.29 with SD=0.91 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils make sure that they practice proper waste segregation in school and even at home. This is a good indicator as the learning acquired by the pupils in school are re-enforced at home as they also pracitced it. Geguinto (2017) claimed that what pupils learned in school must be practiced also at home. This can help the pupils better understand and appreciate the concepts as they observe that what they learn from school can be applied to their activities at home. Experience has always been the best practice therefore it must be given emphasis.

Table 2

Implementation of SWM on Segregation

Indicators	Mean	SD	Description	Interpretation
1. I separate biodegradable (paper, banana peels, cardboard, and vegetables) and non-biodegradable (plastic toys, glass, steel, rubber) wastes at school.	3.26	0.91	Strongly Agree	Highly Positive
2. I separate recyclable wastes (paper, cardboard, plastic bottles) from non-recyclable (food wastes, leaves, twigs) wastes at school.	3.23	0.94	Agree	Positive
3. I separate non-harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others.	3.22	0.92	Agree	Positive
4. I mix all the garbage in one garbage container.	3.10	0.95	Agree	Positive
5. I segregate recyclable items for collection.	3.20	0.88	Agree	Positive
6. I am reading the waste bin label before throwing garbage.	3.27	0.88	Strongly Agree	Highly Positive
7. I observe the proper waste segregation.	3.26	0.91	Strongly Agree	Highly Positive
8. I only practice proper segregation if someone remind me or ask me to do it.	3.11	0.90	Agree	Positive
9. I practice proper waste segregation in school like the way we are practicing at home.	3.29	0.91	Strongly Agree	Highly Positive
10. I practice proper waste segregation to serve as a model for others and to influence others.	3.27	0.90	Strongly Agree	Highly Positive
Overall Mean	**3.22**	**0.91**	**Agree**	**Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

Meanwhile, the indicator, I practice proper waste segregation in school like the way we are practicing at home, has the Lowest Mean of 3.10 with SD=0.95 which is described as Agree and interpreted as Positive Level. This means that the pupil knows the consequence of not properly segretating their waste or garbage before disposing it. It will cause harm to health and environment that is why they are conscious of avoiding it and preventing themselves from doing it. Paghasian (2017) stated that pupils are now observant as they try to compare their activities at home that have similarities in school. In this way, they can connect the similarities and spot the difference and further seek more information and guide as to which will be followed. This can help the pupils differentiate what is learned in the classroom as well as its actual appilcations.

Table 3 exhibits the Pupils' Level of Implementation of SWM on Waste Reduction. It has an Overall Mean of 3.27 with SD=0.91 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils have very high level in implementing SWM in terms of Waste reduction. The pupils believed that one way of saving money and resources is proper utilization of materials to have better waste reduction practices. Anything that lowers waste by starting with less material is considered a waste reduction, utilizing both sides of a piece of paper, purchasing things in bulk rather than individually packed, or utilizing ceramic mugs instead of disposable ones are all easy ways to reduce waste.

Mondina (2021) expressed that producing less trash has a positive economic impact, preserves natural resources, reduces pollution, and frees up landfill space. Instead of creating waste, the goal is to reduce it at or close to the source of generation (in our homes, businesses, and institutions). The most effective approaches to redirect the rising amount of waste are to practice waste reduction and reuse. Thus, it is important to instill in the minds of the pupils the importance of the concepts of waste reduction.

Table 3
Implementation of SWM on Waste Reduction

Indicators	Mean	SD	Description	Interpretation
1. I borrow, share, and/or rent things that are needed occasionally.	3.39	0.96	Strongly Agree	Highly Positive
2. I buy only what I need so that I will not end up throwing away extra food.	3.23	0.90	Agree	Positive
3. I always bring packed lunch in reusable lunchbox.	3.29	0.97	Strongly Agree	Highly Positive
4. I bring water in reusable water containers.	3.27	0.85	Strongly Agree	Highly Positive
5. I am cautious and responsible to every waste I produced.	3.24	0.97	Agree	Positive
6. I bring containers for food & bought.	3.22	0.92	Agree	Positive
7. I bring reusable bags or basket whenever I go to market.	3.28	0.81	Strongly Agree	Highly Positive
8. It is more comfortable for me to use available plastics from the vendor.	3.24	0.91	Agree	Positive
9. It's awkward to bring container when buying cook food for takeout.	3.27	0.91	Strongly Agree	Highly Positive
10. I practice zero-waste initiative to help reduce waste production.	3.25	0.93	Agree	Positive
Overall Mean	**3.27**	**0.91**	**Strongly Agree**	**Highly Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

In the same table, the indicator, I borrow, share, and/or rent things that are needed occasionally, has the Highest Mean of 3.39 with SD=0.96 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils learn to consider priorities before buying certain item/s. They decide first if its really necessary and if they can just ask from the excess of their classmates so that they wont buy items wherein it will cost more leftovers. Jaucian (2022) claimed that letting pupils learn the importance of sharing as well as saving on whatever resources that a person have has a positive impact not just at present but even in future life. It develops valuing on things on hand and on not wasting what a person have.

Meanwhile, the indicator, I buy only what I need so that I will not end up throwing away extra food, has the Lowest Mean of 3.23 with SD=0.90 which is described as Agree and interpreted as Positive Level. This means that the pupils value the importance of saving and not wasting resources. Saving money and resources equals to not wasting it as well. This concepts are important learnings and applications that pupils should learn and acquire as they grow up. In the time of crisis, a person that saves its resources and materials can usually have somethnig to use and utilized instead of worrying on where to get it and looking for funds. Thus, setting priorities to buy and discharge is essential (Jaucian, 2022).

Table 4 reveals the Pupils' Level of Implementation of SWM on Waste Recycling and Reuse. It has an Overall Mean of 3.22 with SD of 0.90 described as Agree and interpreted as Positive Level. This means that the pupils are able to have high level of implementation of solid waste management in terms of waste recycling and reuse. In school the pupils are taught on making creative things out of the recyclable and reusable waste materials. They are also taught the importance of making things out of the stuff they thought that are no longer of use and its importance to the environment and conservation of resources. The process of recycling is gathering worn and abandoned materials, processing them, and turning them into new goods. By reducing the amount of trash placed into public trash cans, it helps to keep the environment cleaner and the air more breathable.

The majority of household waste can be recycled and utilized again. By adding them to the compost pits that have been dug in the garden, organic kitchen waste such as leftover food, vegetable peels, and spoiled or dry fruits and vegetables can be recycled. You can also sell used books, magazines, and bottles

(Gerona, 2022). Thus, concepts on solid waste management have practical applications and positive implications to humans and the environment.

In the same table, the indicator, I reuse my old materials than buying a new one, has the Highest Mean of 3.30 with SD=0.84 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils learn the importance of checking if an item is still good to use and when they no longer want to use it they can give it to someone that can still use it. Lenkin (2021) claimed that reusing old materials instead of buying new ones help save money and resources and wastes. A person just needs to tickle its creativeness and innovativeness to come up with new ideas or even borrow ideas from celebrities that they idolizes. Sources on ideas like these are vast evrywhere. A person just need time for searching ideas even from their freiends and loveones.

Table 4

Implementation of SWM on Waste Recycling and Reuse

Indicators	Mean	SD	Description	Interpretation
1. I convert or redesign waste materials into a new product.	3.13	0.85	Agree	Positive
2. I make decors out of plastic wrappers and other colorful waste materials.	3.17	0.98	Agree	Positive
3. I ignore the importance of recycling.	3.25	0.99	Agree	Positive
4. I initiate generating-income out of waste materials.	3.29	0.95	Strongly Agree	Highly Positive
5. I re-used plastic bottle container as long as it is still reusable.	3.20	0.91	Agree	Positive
6. I reuse my old materials than buying a new one.	3.30	0.84	Strongly Agree	Highly Positive
7 I keep those unfilled papers and used it as scratch.	3.28	0.85	Strongly Agree	Highly Positive
8. I reuse grocery bags.	3.16	0.81	Agree	Positive
9. I reuse washable food containers	3.22	0.90	Agree	Positive
10. I reuse scrap paper into memo pads.	3.21	0.87	Agree	Positive
Overall Mean	**3.22**	**0.90**	**Agree**	**Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

Meanwhile, the indicator, I convert or redesign waste materials into a new product, has the Lowest Mean of 3.13 with SD=0.85 which is described as Agree and interpreted as Positive Level. This means that the pupils are well aware that they should not waste materials and resources as they can explore their creativity and thoughtfulness. This means that they can make mixing, redesigning or give the item/s they find unnecessary but are still useful for others. Lenkin (2021) claimed that in terms of outfits there are many ways to do to make the look of reusing and recycling still attractive and presentable. A person can search on internet some of it and try the one that best fits to their taste. In this way, buying new things that are not that necessary is prevented.

Table 5, presents the Pupils' Level of Implementation of SWM on Waste Disposal. It has an Overall Mean of 3.24 with SD=0.91 which is described as Agree and interpreted as Positive Level. This means that the pupils have positive level of implementation of SWM towards waste disposal. The pupils are well aware of the consequence on not properly disposing their garbage with can lead to infections and other diseases. The pupils also realized that waste disposal is important as they can pollute our environment specially the rivers and seas. Dela Cruz (2020) stated that waste disposal is an important aspect of implementation of solid waste management as it can cause environmental and health issues. Therefore it must be taken properly and that pupils or learners must have better understanding on this.

Table 5

Implementation of SWM on Waste Disposal

Indicators	Mean	SD	Description	Interpretation
1. I dispose hazardous/toxic/special wastes such as laboratory leftover (chemicals) or electronic waste in any garbage container.	3.22	0.89	Agree	Positive
2. I throw my waste properly and accordingly.	3.28	0.91	Strongly Agree	Highly Positive
3. I practice waste recycling and re-use for recyclable and reusable materials than immediate waste disposal.	3.33	0.93	Strongly Agree	Highly Positive
4. I use aerobic and anaerobic composting for biodegradable waste materials.	3.10	0.99	Agree	Positive
5. I practice the separation of wet waste and dry waste disposal.	3.31	0.97	Strongly Agree	Highly Positive
6. I throw waste materials in common open dumps.	3.11	0.86	Agree	Positive
7. I dispose biodegradable wastes into a compost pit.	3.24	0.92	Agree	Positive
8. I avoid burning waste materials.	3.29	0.85	Strongly Agree	Highly Positive
9. I throw and leave my garbage at proper garbage bins..	3.18	0.83	Agree	Positive
10. I agree if there will be a sanitary landfill in the nearby area for waste disposal and processing.	3.30	0.92	Agree	Highly Positive
Overall Mean	**3.24**	**0.91**	**Agree**	**Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

In the same table, the indicator, I practice waste recycling and re-use for recyclable and reusable materials than immediate waste disposal, has the Highest Mean of 3.33 with SD=0.93 which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils prefer to use the concept of recycling and reusing materials or items rather than disposing it even if it still can be utilized. Pupils value the importance of saving resources instead of doing impulsive purchases. Romeo (2020) claimed that the learners do not only learn the importance of SWM program but also realized the practical implications in doing the activities as it helps them to do better and valuable things like cleanliness and saving.

Meanwhile, the indicator, I use aerobic and anaerobic composting for biodegradable waste materials, has the Lowest Mean of 3.10 with SD=0.99 which is described as Agree and interpreted as Positive Level. This means that the pupils learned the needs to master the concepts and skills in composting. At young age, they learn that it is one of the cause of global warming and climate change and that they tend to minimize its continuous effects knowing that its irreversible or it takes a lot of time to recover. Thus, teachers must assist the pupils in learning how and in making composts. Garcia (2019) stated that open burning can start devastating fires in our communities, permanently damage materials that could be salvaged, reused, or composted, and produce toxic smoke and ash. This is especially true during the dry and hot season. Particulate matter and dioxin pollution from open burning can cause disease, especially in young children, the elderly, and those who are chemically sensitive. It is important to making composts instead of burning waste. Therefore teachers and parents may collaborate in making sure that pupils learn and value the importance of composting as well as the effects on burning any kind of waste.

Table 6 discloses the Overall Pupils' Level of Implementation of SWM. It has an Overall Mean of 3.24 with SD=0.93 which is described as Agree and interpreted as Positive Level. This means that the pupils have high level of activites in terms of implementing solid waste management. The pupils feel that it is necessary to take their part in the ongoing program as they too are contributors of waste. Coracero et al. (2021) claimed that implementation of solid waste management is increasingly present in the country. However, there are still many things to do to make it more efficient and effective. All sectors of society should act and not just rely on others to perform and implement the needed adjustments.

In the same table, Waste Reduction has the Highest Mean of 3.27 with   SD=0.91, which is described as Strongly Agree and interpreted as Highly Positive Level. This means that the pupils can do better in reducing their waste by always considering and deciding before disposing an item. In this way the pupils do

not only save money but also from wasting the resources that are provided to them by their parents. Mondina (2021) expressed that practical applications of the concept of waste reduction as well as its simplicity makes it more attractive to learners. This also allows the learners to explore their creative side making it more attractive and interesting to them.

Table 6
Overall Implementation of SWM

Variables	Mean	SD	Description	Interpretation
Segregation	3.22	0.91	Agree	Positive
Waste Reduction	3.27	0.91	Strongly Agree	Highly Positive
Waste Recycling and Reusing	3.22	0.90	Agree	Positive
Waste Disposal	3.24	0.99	Agree	Positive
Overall Mean	**3.24**	**0.93**	**Agree**	**Positive**

Note: 3.26- 4.00 High Positive 2.51- 3.25 Positive 1.76-2.50 Negative   1.00-1.75 Highly Negative

Meanwhile, Segregation and Waste Recycling and Reusing have the Lowest Mean of 3.22 with SD=0.91 and SD=0.90 described as Agree with the interpretation of Positive Level. This implies that teachers need to improve or give more activities and discussions on segregation, recycling and reusing specially in terms of appilcation of its concepts. This means that the pupils are in need of more attention and learning on concepts of segregation, recycling and reusing of used materials. Gerona (2022) claimed that pupils do not have more activites about waste segregation, recycling and reusing most specially at home as this is quite crucial and usually task on this is given to older ones that are more mature and knows what to properly do. However, pupils need to learn its concepts so that they wont get surprise on what to do once they are assigned to it.

Problem 3. Is there a significant relationship between pupils' level of capacities and implementation of solid waste management?

Table 7
Test Correlation Between Capacities and Level of Implementation of SWM

Level of Capacities	Implementation of SWM			
	r-value	p-value	Decision	Interpretation
Knowledge	0.642	0.000	Reject Ho	Significant
Attitude	0.632	0.000	Reject Ho	Significant

Table 7 discloses the Test Correlation Between Capacities and Level of Implementation of SWM. For capacity in terms of knowledge, it registered an r-value of 0.642 with p-value of 0.000 which is lower than the critical value of 0.05 level of significance. This means that significant relationship between knowledge and implementation of solid waste management is registered. Thus the null hypothesis is rejected. Pupils' knowledge on solid waste management is important in implementing the program. With the knowledge and skills that the pupils have it will be easy for them to practice the various concepts and activities in terms of implementing solid waste management even on their own. Gegunto (2017) and Dela Cruz (2020) both claimed that knowledge towards the implementation of solid waste management is essential as it can provide individuals various ideas and form of activities that will ensure its proper implementation as well as its effects on health, environment and human activites.

For capacity in terms of attitude, it registered an r-value of 0.632 with p-value of 0.000 which is lower than the critical value of 0.05 level of significance. This implies that significant relationship between

attitude and implementation of solid waste management is registered. Thus the null hypothesis is rejected. Pupils' attitude on solid waste management is impotant in implementing the program. With the correct attitude, it is easier for them to utilize their acquired knowledge and skills in performing the various concepts and activities in terms of implementing solid waste management even on their own. Romeo (2020) and Mondina (2021) both expressed the importance of developing positive attitude towards implementation of solid waste mangement. The researchers claimed that attitude specially on shared responsibility can greatly influence the success of the SWM program as it will assure that no parties will slack off and that everyone will feel that their collaborative efforts will be beneficial to all of them as well as on ensuring the achievement of same goals and objectives towards better environment and habitat for all.

Problem 4. What enhancement program can be developed based on the results of the study?

Enhancement Program on the Implementation of Solid Waste Management (SWM)

The Department of Education has been a major partner in the SMW implementation because of the huge number of participants it can offer. The participation of pupils in environmental protection and preservation is highly encouraged through environmental education. School children are given the obligation to actively participate in activities advocating the environment because they are highly vulnerable to the devastating effects of degrading surroundings.

To further educate and empower more the teachers and school heads on the SWM implementation, a constructive enhancement program will be provided as an opportunity for the teachers and school heads to harness their skills, principles and idealism that would promote and enable the teacher to become more competent in managing a stern execution of the SWM program. A well – prepared and equipped teachers and school head concerning this matter is the desired end – product.

Objectives	Activities	Persons Involved	Time Frame	Budget	Success Indicator
Expand the teachers' and school heads' knowledge on the different issues on solid waste management program.	Seminar-workshop on the various concepts of SWM for knowledge Acquisition	School Heads Teachers Parents Resource Speakers	Summer of 2023	MOOE (2,500)	Teachers' and school heads and stakeholders' knowledge on the different issues on solid waste management program are improved.
Expand the teachers' and school heads and stakeholders' attitude on the different issues on solid waste management program.	Seminar-workshop on the various concepts of SWM for Attitude Enhancement	School Heads Teachers Parents Resource Speakers	Summer of 2023	MOOE (2,500)	Teachers' and school heads' knowledge on the different issues on solid waste management program are improved.
Training on Enhancing Teachers' & School Skills Heads Implementation on Solid Waste Management Program	Seminar-workshop on the various concepts of SWM for Skills Acquisition and Enhancement	School Heads Teachers Parents Resource Speakers	Summer of 2023	MOOE (2,500)	Teachers' and school heads' knowledge on the different issues on solid waste management program are improved.

4. Conclusions and Recommendations

From the findings of the study, the following conclusions are derived:

1. Pupils' overall level of capacities on solid waste management was at Positive Level.

2. The overall level of implementation of Solid Waste Management (SWM) was at Positive Level.

3. The test of relationship on the respondents' level of capacities was significant towards their level of implementation of solid waste management. Therefore, the null hypothesis was rejected.

This study has contributed to the understanding of effects of respondents' capacities towards level of implementation of solid waste management. The recommendations are as follows:

1. The school heads are encouraged to give information drive, symposium, and other related activity to improve the pupils' knowledge and understanding on SWM.

2. The teachers are encouraged to employ some practices, policies and provide appropriate materials, that would encourage pupils to segregate, recycle and reuse. Moreover, teachers and parents are encouraged to collaborate so that implementation of SWM in school is re-enforced at home.

3. School community are encouraged to continue to coordinate with each other on providing various activities that will enhance the pupils' capacities and level in implementation of SWM as these two (2) aspects have relationship to each other. Furthermore, the school can also implement the suggested enhancement program with application of PDCA or Plan-Do-Check-Act Cycle to improve the implementation of SWM.

4. Future researchers may use this study as their source to expound more related information and be their basis for enhancing the implementation of Solid Waste Management.

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