Pupils' Awareness, Knowledge, Attitude and Practice of School-Based Solid Waste Management in a Public Elementary School in the Philippines

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Abstract

This study assesses the level of awareness, knowledge, attitude, and practices of Grade 6 pupils in terms of the solid waste management of a public elementary school in Laguna, Philippines. Using a descriptive research design, the data has been collected from the responses in the survey questionnaire distributed to the selected respondents and analysed using descriptive statistics. Findings reveals low level of pupils' awareness, knowledge, attitudes, and practices on the solid waste management. Findings also reveals that while the school has already introduced solid waste management to the pupils, they still need to have a systematic and well-defined goals and practices to highlight the importance of managing waste. Based on informal interviews with the head teachers and school leaders, the researcher has been able to confirm that the school does not have any formally drafted guidelines and policies about the school's solid waste management program. Thus, the study recommends specific ways to enhance the school-based solid waste management program of public elementary schools in the Philippines.

Keywords: Attitudes, Awareness, Knowledge, Practices, Solid Waste management

Introduction

Solid Waste Management (SWM) is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing, and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering, and other environmental considerations (Leblanc, 2020). Waste can be categorized based on material, such as plastic, paper, glass, metal, and organic waste.

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Categorization may also be based on hazard potential, including radioactive, flammable, infectious, toxic, or non-toxic wastes. Categories may also pertain to the origin of the waste, whether industrial, domestic, commercial, institutional, or construction and demolition or even in schools (particularly public schools) since it is expectedly populated.

The school defined solid waste as thrown away food waste, plastic, paper or other materials used for packaging. This also includes waste made by school operations like papers, boxes, and other used visual materials which are already presumed as useless and unwanted, but the school cannot find or identify a designated place on where to discard it (Parocha et.al., 2015). This is particularly true in the case of public elementary schools in the Philippines where the population of pupils is high. Furthermore, it has been a practice in most Philippine schools that foods for the pupils are bought or brought from homes and not supplied. Those pupils are the primary consumers of packed food and bottled refreshment products that contribute to high volume of trash and other waste materials. At a rapid pace, its safe disposal creates predominantly serious problems for the schools (Parocha et. al., 2015).

Many schools have already been struggling to think of imaginative ways to implement effective waste management and to have an effective and efficient waste management program. Firstly, it is a challenge to get the pupils, teaching and non- teaching personnel actively participate in the program. It may not always be easy as one may encounter members of the school who are not as enthusiastic or engaged in the projects as they could be. According to the National Solid Waste Commission, wastes in the Philippine cities and municipalities are mostly composed of 52% organics, 28% recyclables, and 18% residuals (i.e., waste that cannot be reused, recycled, or composted). Much of the waste, about 80% organics and recyclables can be safely returned to nature or industry without resorting to landfills and incineration (Grate, 2019).Through proper segregation, organics can be composted in homes, schools, and offices. In a linear waste management approach, organics are wasted instead of being turned into a resource. Under a zero-waste approach, recyclables are reused and recycled and become a source of livelihood for waste workers as well.

This practice of waste segregation is crucial as the issue of solid waste management is fast becoming a great concern in many schools. Cities and municipalities in the Philippines. Rapid urbanization and industrialization have greatly changed the patterns of consumption of people. The kinds of waste generated by pupils today have become more complex. In a community, the waste generated by a population is primarily a function of the people's consumption patterns and, thus of their socio-economic characteristics (Abdel-Shafy, & Mansour, 2018). The growing universal concern for possible detrimental effects of solid wastes has also prompted the government to come up with creating laws to regulate solid waste management (SWM). The most recent and comprehensive of them all is the Ecological Solid Waste Management Act of 2000 or Republic Act 9003. Local governments made their own ordinances to support the implementation of this law.

Despite the presence of laws and measures to address SWM concerns, SWM persists as one of the growing problems of each city and municipalities in a developing country (Ferronato, & Torretta, 2019). Problems on SWM are related to improper practices of the pupils and their lack of cooperation, hence, a systematic study of participation on SWM is needed. By looking into the gaps in knowledge and favourable attitude towards SWM and reasons for the reluctance of school administrators to adopt more participatory approaches, mechanisms may be developed for increasing pupil's participation.

Furthermore, in one of the public schools in Laguna, Philippines, a program entitled "Youth for the Environment in School Organization was adopted. This program is linked with other agencies/institutions as a basis for implementing a school-based solid waste management program, but it has been observed that it lacks specific guidelines appropriate to a public-school setting with a big population. Similarly, all Edukasyong Pantahanan at Pangkabuhayan (Home Economics) Grade 6 pupils started to assume the important task of transforming raw materials, discarded materials, indigenous materials into valuable and usable projects that will satisfy many of the basic needs of the family and the community. However, it can be observed that such undertaking did not prosper. The haunting question of whether the schools are successful in this aspect is still a concern.

There is an urgent need to streamline and to create the awareness of these young minds to environmental problems and concerns. Besides, there is no existing school-based solid management program in the school that will guide each of its stakeholders to develop responsibility in addressing such issues on solid wastes. Specifically, this study aimed to: (i) determine the respondent's awareness of the existing solid waste management activities of the Public Elementary School in Laguna, Philippines; and (ii) assess the knowledge, attitudes, and practices of the respondents towards solid waste management.

Materials and Methods

Research Design

This study utilized descriptive research. This is the most appropriate way to know the level awareness, knowledge, practices, and attitudes towards a school-based waste management program. Descriptive research is a method that describes the characteristics of the population or phenomenon that is being studied. This methodology focuses more on the "what" of the research subject rather than the "why" of the research subject (McCombes, 2019).

Research Participants

The respondents of the study are composed of randomly selected 202 Grade 6 pupils at a Public Elementary School in Laguna, Philippines. This represents 56% of the total population Grade 6 pupils, which is 360.

In terms of sex, 52% of the total respondents are male and 48% female. The average age of the total respondents is 11 years old; 48% are from the 9-11 age bracket; 50% from 12 to 13 bracket and two percent are 14 years old and above. All the respondents have an average of two male and two female siblings. Forty percent of the respondents have siblings aged from one to 10 years old; 43% from 11 to 20 years old; seven percent have siblings aged 20 to 30 years old, one percent have siblings from 31 and older; while nine percent indicated that they have no siblings. This information is significant since it can also be used as a basis in determining the attitude and practices of the entire household regarding solid waste management.

Ten percent of the respondents have been studying in the said school for one to three years during the conduct of the study; eight percent for four to five years, while almost all the respondents or 82% have been studying in the said school for six to eight years. This means that most of the respondents are already familiar with the waste management program of the school, if any. They can be considered as credible informants about whatever programs the school has implemented and if these programs have been proven successful or not. The respondents can also be expected as having developed the habit of disposing their waste properly inside the school premises.

Instrumentation

The researcher devised a survey questionnaire and distributed to Grade 6 pupils of a Public Elementary School. Secondary data were also obtained to gather information about the different waste management programs of the local and national government. The survey questions were explained thoroughly to the pupils and the study methods and objectives were also made clear to them before administering the survey. Consent of the teachers and parents was also sought. To determine the respondents' awareness of the existing waste management activities of the school, six questions were asked. These questions contain different observations and contributions in which the respondents were instructed to give multiple answers accordingly. To assess the knowledge, attitude, and practices (KAP) of the respondents about solid waste management, KAP scoring was used. Respondents were presented with leading statements about solid waste management practices in which they were requested to indicate their level of agreement or disagreement with each statement using five-point Likert scale such as *Strongly Disagree (1)*, *Disagree (*2), *No Opinion (3), Agree (4),* and *Strongly Agree (5).* The instruments were validated by subject experts. This validation resulted to slight modification of the original researcher-made questionnaire.

To validate the responses of the pupils, informal interviews with head teachers, and school leaders were conducted.

Data Analysis

Data gathered from the survey questionnaire were analysed through descriptive statistics. Median scores were computed and total positives (percentage who

agreed), and total negatives (percentage who signified disagreement) were determined.

Results and Discussion

Awareness about the School Waste Management Program

About 186 or 92% of the pupils indicated that they learned/heard about the Solid Waste Management Program from their teachers inside the school, radio/tv got 71 total responses, 43 learned from posters and advertisements, 55 pupils from their parents and five pupils learned about the program from other sources. The respondents were also asked about the types of solid waste they do often see or produce in the school environment. One hundred six-nine or 84% pupils indicated that they often see plastics (bags and bottles, 55% observed paper and cartons; 47% responded to tins or cans; and 46% to food wastes.

In relation to the existing solid waste management activities, 142 respondents (70%) responded that they use plastic bags and containers; 45% answered tins/cans; 39% of the respondents indicated waste baskets; 36% used cartons and 24% put their wastes in oil pails and buckets. When asked about their assessment about the practice of solid waste management in the school, 93% of the respondents answered Good, 10% answered fair, while 12% answered Not Good. The survey also asked the respondents if they are willing to segregate waste for recycling. Almost all or 94% responded Yes while only 14% answered No. Only two % responded, "I don't know."

In terms of the awareness about the presence of waste in the school premises, 160 respondents observed mosquitoes and cockroaches in the school; 96 respondents noticed dark, smelly flowing water; 28 respondents noticed fire or burning inside the school and 28 respondents saw rats; 27 respondents indicated that they could see domestic animals like dogs and cats; and 15 respondents noticed scavengers. Generally, the respondents are already aware or exposed to the school waste management program. Based on their responses, they already know the basics on how to dispose of their garbage properly. The negative comments can be considered as insignificant but there are a few details that need to be addressed for the improvement of the program.

Based on the input of the head teachers, the success of any waste management program would greatly depend not only on the part of the pupils or their teachers. This activity must need a joint participation and cooperation of the stakeholders (community, household especially the parents and siblings and school authorities. The concept of Reduce, Reuse and Recycle (3 R's) must be fully introduced and included in the school-based waste management program. Though this strategy is already a by-word for most of the citizens, the true essence has not yet been observed and practiced.

Knowledge, Attitude and Practices of Grade 6 pupils about Solid Waste Management

A. Knowledge

Findings show that the knowledge on solid waste management among the Grade 6 pupils was considered very low with a median of 2. This indicates their disagreement with most of the awareness questions. Specifically, the pupils were not aware or in disagreement when it comes to implementation of a solid waste management program, process of waste segregation, garbage segregation and throwing of collected waste, process of recycling, and harmful effect in the environment. Surprisingly, pupils strongly disagreed in the awareness of the importance of proper solid waste management to avoid possible health problems. In general, this means that the Grade 6 pupils of the school were not fully aware of the importance of proper waste segregation.

Table 1: Knowledge of Grade 6 Pupils about the School Solid Waste Management

Statement	1	2	3	4	5	Median Score
I know that our school is implementing a solid waste management program.	71	106	15	8	2	2
	35%	52%	7%	4%	1%	**Low Level**
I am fully aware about the process of proper waste segregation.	79	77	17	11	18	2
	39%	38%	8%	5%	9%	**Low Level**
I know how to segregate garbage and where to throw	88	84	12	8	10	2
	44%	42%	6%	4%	5%	**Low Level**

the collected waste.						
I am aware about the process of recycling.	89	85	12	12	4	**2**
	44%	42%	6%	6%	2%	**Low Level**
I believe that garbage or waste is harmful to the environment.	99	71	15	7	10	**2**
	49%	35%	7%	3%	5%	**Low Level**
I am aware that it is important to follow proper solid waste management to avoid possible health problems.	116	64	2	9	11	**1**
	57%	32%	1%	4%	5%	**Low Level**

Truly, awareness may not easily be translated into practices. For instance, Ifegbesan (2010) explored on the level of awareness and practices of waste management of 650 secondary school pupils from Ogun State of Nigeria. A self-administered questionnaire was used, and the findings showed that pupils were aware of the serious problem of waste management in their school, but they had poor waste management practices.

B. Attitude

Generally, there is a disagreement when it comes to attitude of the pupils towards solid waste management. It is exhibited by the respondents regarding proper solid waste management in the school as shown in Table 3. This is exemplified in the computed median score for all the statements which indicates their level of disagreement. The respondents believe that the school is not practicing very effectively the waste disposal method. They also disagreed with the statement that speaks about their responsibility as pupils to practice waste disposal. This also signifies that still there would be a tendency for them to burn garbage inside the school premises and may be even somewhere else. This practice is prohibited as far as the proper waste management is concerned (Ecological Solid Waste Management Act of 2000).

Similarly, there was also a disagreement that they should participate actively in the schools' effort for solid waste management program. Also, even the teachers do not serve as a good model in terms of their practice of waste disposal according to

the pupils. This negative attitude among pupils indicates that they could not be easily encouraged to practice proper waste management in the school.

Table 2: Attitude of Grade 6 Pupils about the School Solid Waste Management

Statement	1	2	3	4	5	Median Score
I believe that our school is practicing a very effective waste disposal method.	71	104	2	10	2	2
	35%	51%	1%	5%	1%	Low Level
I believe that proper waste disposal in school is also a responsibility of the pupils.	93	94	0	8	7	2
	46%	47%	0%	4%	3%	Low level
I feel that I must participate actively in our school's solid waste management program.	82	85	7	22	6	2
	41%	42%	3%	11%	3%	Low Level
I believe that collected waste or garbage must not be burned inside the school premises.	92	60	26	12	13	2
	46%	30%	13%	6%	6%	Low Level
I feel that the teachers are trying to show us a good example of proper waste disposal.	98	82	8	5	9	2
	49%	41%	4%	2%	4%	Low Level
I believe that the pupils in our school must cooperate in the proper disposal of garbage in our school.	86	85	6	23	2	2
	43%	42%	3%	11%	1%	Low Level

According to the findings of Madrigal and Oracion (2017) about solid waste management awareness, attitude and practices in a Philippine Catholic Higher Education Institution, behavioural intention and attitude indeed influenced behaviour. In other words, the very high awareness and attitude on solid waste management favourably influenced their solid wastes disposal practices at home and in school. However, solid waste disposal practices match the very-low level of

awareness. The result implies that while knowledge and attitude may determine the course of person's environmental action, they must also be aligned with the satisfaction and benefit that a person can derive from being concerned and committed to environmental concerns and initiatives.

C. Practices

Similar with the findings about the knowledge, and attitude, the result reveals negative perceptions of pupils about practices on waste management. The median score for all statements is 2 which signifies disagreement. It should be noted that statements are indicative of the different waste management techniques practiced by the pupils. One of the interesting practices was recycling including own's school materials like paper, notebook, and books which had 94% and 95% negative responses.

This is supposedly a good practice as pupils have so much more blank pages in their notebooks and leftover pad papers when school closes that could be substantial if recycled properly. This not only reduces the volume of wastes generated but also saves some money from buying more school supplies in the next school year. It also seems that there is still a need to further instil among the pupils (87% total negatives) the practice of waste segregation by utilizing the designated appropriate containers. Some pupils while not throwing garbage anywhere else do not actually mind where to properly dispose their wastes. This practice poses some problems at the final stage of waste management.

Based on the informal interviews with head teachers and school leaders, the researcher was able to confirm that the school does not have any formally drafted guidelines and policies about the school's solid waste management program. The school is just implementing the DepEd Memorandum No. 58, S. 2011 entitled Creating the Task Force on National Greening Program, wherein the Department of Education (DepEd) issued guidelines to concretize directions in the implementation of the National Greening Program (NGP). However, since this program is an integration of Gulayan sa Paaralan, Solid Waste Management and Tree Planting Under the National Greening Program (NGP), it did not focus mainly on the specific guidelines and policies on solid waste management.

Table 3: Practices of Grade 6 Pupils about the School Solid Waste Management Program

Statement	1	2	3	4	5	Median Score
I always practice waste segregation inside our school premises by throwing garbage in appropriate containers.	85	87	4	14	12	2
	42%	43%	2%	7%	6%	**Low Level**
I always conduct waste recycling in our school.	79	90	22	10	1	2
	39%	45%	11%	5%	0%	**Low Level**
I always practice waste recycling with my own school materials like paper, notebook and books.	80	101	11	7	3	2
	40%	50%	5%	3%	1%	**Low Level**
I am always participating in our school's waste management activities.	74	95	18	11	4	2
	37%	47%	9%	5%	2%	**Low Level**
I always minimize the garbage/waste so I can help in the successful implementation our school's Solid Waste Management Program.	84	89	11	11	7	2
	42%	44%	5%	5%	3%	**Low Level**
I am always following the rules imposed by the school about solid waste management.	80	95	6	12	9	2
	40%	47%	3%	6%	4%	**Low Level**

This supports the findings of Desa et al. (2012) that assessed the attitudes, behaviour, and practices towards the solid waste management of 591 first year pupils from UKM, Bangi Campus showed that pupils have a high level of behaviour and practices regarding solid waste management program. However, the researchers noted that waste education and awareness strategy are still needed to develop more pupils' awareness and attitude towards managing solid waste to reduce the impact of the waste problem in campus.

Conclusion

The study provides discussion about the level of pupils' awareness, knowledge, attitudes, and practices of school's solid wate management. The knowledge and attitudes of the pupils were all at low levels and they cannot practice what they know due to the absence of a well-defined school solid waste management program. Despite the continuous initiative of the school as well as the Department of Education, still solid wastes in the school are not well-managed.

Even though some pupils know how to segregate, they still do not practice it. Awareness is important but it is not enough especially if there is no application. Teachers can employ different strategies to get the pupils interest to participate in the solid waste management program of the school. Although Grade 6 pupils get involved only because of the competition, the teachers must also be able to train them to have the right attitude. Educating the pupils about the importance of solid waste management and allowing them to participate in the planning and implementation can help ensure the success of the program. Based on the findings of the study, the researcher is hereby proposing a more defined and focused SWM Program for the school. The stakeholders and building of positive attitudes and awareness leading to proper practice of SWM, must be highly considered to make a lasting and sustainable program. The following recommendations are hereby proposed:

Coordinating properly. The school authorities must actively coordinate with the local government regarding the implementation of an efficient solid waste management program. Some respondents revealed that they are already practicing proper waste segregation, garbage bins are not regularly collected, and hence the wastes just stay in the loaded bins for several days. This will be addressed through proper coordination with the local authorities.

Adopting appropriate methodology. Private Institutions must also be encouraged to either help in creating awareness about solid waste management or they must also practice proper disposal of their garbage. The school and the private institutions located in the area must regularly meet and discuss about important matters

concerning waste management and to formulate and adopt appropriate methodology for waste segregation.

Developing awareness among the household members. Parents and other household members must be invited to participate in the program drive and other activities geared towards an effective solid waste management program. The activities must be conducted and participated by both the children and the parents.

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