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Ecological solid waste management among student organization

Lynn Marie P. Simporios*, Leonarda T. Awayan

Graduate School, Notre Dame of Dadiangas University, General Santos City, Philippines

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Abstract

All educational establishments are instructed by law to educate the public on the principles and practices on solid waste management. Thus, Department of Education ordinance No. 72, series of 2003 establishment of the Youth for Environment in Schools Organization (YES – O), one of the objectives of this organization is to establish specific and doable programs, projects and activities to address issues and concerns on the environment and ecology. With the present situation, it is important to assess the different solid waste management practices among these organizations within the selected schools of General Santos City. Moreover, this study aimed to identify the ecological solid waste management practices among YES – O members in terms of waste segregation, reduction, reuse, recycling, and disposal. This study is conducted to determine the practices on solid waste management of the YES–O. This study used a descriptive quantitative design. The chosen schools were identified through purposive random sampling and each school had 50 participants respectively. Questionnaire was given to the fifty members of YES – O. Data were gathered, analyzed, and interpreted using mean. Findings show that students often practice ecological waste management in terms of segregation, reduction, reuse, recycle, and disposal. However, ecological waste management practices in terms of recycling needs to be addressed and be given attention to since it got the lowest mean among the five indicators.

***Corresponding Author:** Lynn Marie P. Simporios ✉ lynnmarie.simporios@deped.gov.ph

Introduction

Solid waste management is the gathering, transport or dumping and dealing of waste materials. It transmits to materials produced to human undertakings, and the procedure usually assumed to sustain its outcomes on health, the environment and aesthetics. It lessens or eradicates opposing impacts on the environment and human health relatively provisions economic development and enhanced the eminence of life. In today's polluted world, learning the precise approaches of handling the waste produced has become vital (Marcello *et al.*, 2014).

Every process of waste prevention and waste management need public involvement. Education is a vital element of solid waste management that should be present to begin a worthy program for the public (Villanueva, 2013). Awareness of solid waste management will make change on how people look at garbage. People raised up thinking that waste is waste, it should not be moved or one should not go close to it. They supposed before that all types of waste should just be thrown in one container (Sarino, 2012). Awareness complemented by participation is the key for students to be tangled in the waste management program of the schools where actual and maintainable application of the proper waste management practices could be achieved (Punongbayan, 2014).

Section 55-56 of Republic Act 9003 or The Ecological Solid Waste Management Act specifies that the national government in coordination with Department of Education (DepED), Technical Education and Skills Development Authority (TESDA); Commission on Higher Education (CHED) and Philippine Information Agency (PIA), should conduct an ongoing education and information operation on solid waste management and reinforce the incorporation of environmental concerns in school curricula at all levels, with specific emphasis on the concepts and practices of waste management principles like segregation at source, reduction, recycling, re-use and composting, in order to stimulate environmental awareness and feat among the community.

Segregation at source is a solid waste management practice of sorting out different materials found in solid waste in order to encourage recycling and re-use of resources and to reduce the huge amount of waste for collection and disposal (Marcello *et al.*, 2014). Recycling keeps landfill space and also frees the resources that were used to create an additional new product. It treats used or waste resources through practices of creating them appropriate for advantageous use in a way that the original products could lose their distinctiveness. In many cases, recycling can also be of help in saving energy. Schools acquiring paper products made from recycled content support to guarantee a practical market for recycled products (Griffiths, 2010).

Reuse is the manner of recuperating materials projected for the same or different purpose without the variation of physical and chemical characteristics (Marcello *et al*, .2014). Re-using saves the energy and resources that would have been utilized to create a new product and outcomes in fewer products going into the garbage bin and ending up in landfill (DepEd, 2003). When nothing from the 3Rs choices apply, then liable disposal of the waste is obligatory. One actual common irresponsible disposal of waste is littering.

General Santos City is known as a greatly developed city and is also known as the Tuna Capital of the Philippines. Its considered location, typhoon-free climate, as well as contemporary infrastructures have instigated it to be a hotspot of local and international investments. The fisheries and the agro-industrial sector of the city added most to the city's income. Nevertheless, the socio-economic progress within the city has subsidized to Solid Waste Management (SWM) problems. As of 2007, approximations display that 292, 572 kg/day (292.5 tons/day) of waste is produced within the city with its average per capita of 0.44 kg per day. If equated to the population and the growth rate of the city, it can be established that the amount of waste produced within the city per day deteriorates as the time passes specifically in the absence of intervention. With this, City of General

Santos established to pass the City Ordinance No.12, series of 2008,also known as the " General Santos City Ecological Solid Waste Management Ordinance of 2008".The provisions, goals and objectives are very much comparable with the Republic Act 9003. This was an effort to generate consciousness among the public on the significance of environmental protection and preservation. Involved in this ordinance are the schools to be held responsible for the collection, segregation, recycling of biodegradable, recyclable, compostable and reusable wastes.

Thus, DepEd ordinance No. 72, series of 2003 establishment of the Youth for Environment in Schools Organization (YES – O), one of the objectives of this organization is to establish specific and doable programs, projects and activities to address issues and concerns on the environment and ecology (Adelou *et al.*, 2014). This includes waste management, segregation and recycling programs. With the present situation, it is important to assess the different solid waste management practices among these organizations within the selected schools of General Santos City. Moreover, this study aimed to identify the ecological solid waste management practices among YES – O members in terms of waste segregation, reduction, reuse, recycling, and disposal.

Materials and methods

Research Design and Respondents

This study used a descriptive quantitative design. The respondents of this study were determined using purposive random sampling. Three selected secondary schools in General Santos City namely Lagao National High School, Ireneo Santiago National High School of Metro Dadiangas, and General Santos City School of Arts and Trades and each school have fifty (50) respondents. These respondents are currently members of the YES – O and were identified using random sampling.

Research Instrument

Questionnaire was administered to the students. The researcher adopted the questionnaire of (Punongbayan, 2014) and was modified. After the modifications being made, it was validated by five experts and got an overall mean of (X = 06) which is described as very satisfactory. The questionnaire has five sets to identify the ecological solid waste management in terms of waste segregation, reduction, reuse, recycling and disposal respectively. It was in a form of checklist. It had for levels of quality: always (4), often (3), seldom (2) and never (1). To interpret the ecological waste management among student organization, the scale was used: always practiced (3.25 – 4:00), often practiced (2.50 –3.24), seldom practiced (1.75 – 2.49), and not practiced (1.00 – 1.74).

Data Gathering Procedure

Prior to the conduct of the study, the researcher asked permission from the Schools Division Superintendent. As soon as permission was granted, the researchers coordinated with the different school heads of the selected secondary public schools in the Division of General Santos City and sought approval. The researchers also asked for the list of members of the YES–O members of each school and were randomly selected to be participants of this study. When everything was set, the researchers administered the questionnaire in their respective schools. All data gathered were subjected to statistical analysis.

Statistical Analysis

To determine the ecological waste management practices among student organization in terms of waste segregation, reduction, reuse, recycling and disposal, mean was used.

Results and discussion

Practices on solid waste management in terms of segregation

Table 1 shows the mean in the students' practices on solid waste management in relation to segregation. The respondents claimed that their practices in relation to segregation were showed always practiced in the following indicators: in segregating biodegradable and non-biodegradable wastes at

school with a mean of (X= 3.42), and often practiced in separating recyclables wastes from non-recyclable wastes at school (X=3.29), in separating non-harmful wastes from toxic and hazardous wastes such as laboratory chemicals (X=2.96), in not mixing all the garbage in one garbage container.(X=3.24), and segregating recyclable items for collection (X=2.95). On the overall, the mean obtained in the practices on solid waste management in terms of segregation is (X=3.17) described as often practiced This finding found support with previous study of (Punongbayan, 2014) that institutions show effectiveness on waste management practices in terms of segregation. This data signifies that students' practices on solid waste management in relation to segregation are frequent.

Table 1. Mean in the Practices on Solid Waste Management in Terms of Segregation.

Indicator	Mean	Description
1. I Segregate biodegradable and non-biodegradable wastes at school.	3.42	Always Practice
2. I separate recyclables wastes from non-recyclable wastes at school	3.29	Always Practice
3. I separate non-harmful wastes from toxic and hazardous wastes such as laboratory chemicals.	2.96	Often Practice
4. I don't mix all the garbage in one garbage container.	3.24	Often Practice
5. I segregate recyclable items for collection.	2.95	Often Practice
Average	3.17	Often Practice

Practices on solid waste management in terms of reduce

Table 2 shows the mean in students' practices on solid waste management in terms of reduce. In relation to students practices on solid waste management in terms of reduce it resulted that they often practice on the following indicators: borrow, share, and/or rent thing that are needed with a mean of (X=3.08), pack their lunch in reusable lunchbox (X=3.01), bring water in reusable water bottles at the school (X=3.33), and being cautious and responsible to every waste they produced (X=2.80) .On the other hand, only item 2 (I buy only what I need so that I will not end up throwing away extra food) obtained a description always practice with a mean of (X=3.53).

On the average, the practices on solid waste management in terms of reduce obtained a mean of (X=3.12) described as often practice. This result signifies that students' practices on solid waste management in terms of reduction are habitually practice.

Table 2. Mean in the Practices on Solid Waste Management in Terms of Reduce.

Indicator	Mean	Description
1. I borrow, share, and/or rent thing that are needed.	3.08	Often Practice
2. I buy only what I need so that I will not end up throwing away extra food.	3.53	Always Practice
3. I pack my lunch in reusable lunchbox.	3.01	Often Practice
4. I bring water in reusable water bottles at the school.	3.33	Often Practice
5. I am cautious and responsible to every waste I produced.	2.80	Often Practice
Average	3.12	Often Practice

Practices on solid waste management in terms of recycle

Table 4 reveals the mean in the practices on solid waste management in terms of recycle. In the practices on solid waste management in terms of recycle students claimed that they often practice in: converting or redesigning waste materials into a new product with a mean of (X=2.79), making decors out of plastic wrappers (X=2.59), valuing the importance of recycling (X=3.15), initiating a generating-income out of waste materials (X=2.70). On the average, the obtained mean in the practices on solid waste management in terms of recycle is 2.81 described as often practiced.

The result of this is in consonance to the study conducted by (Adelou *et al.*, 2014) that students advocate on activities on recycling rather than throwing wastes anywhere.

This data justifies that practices level on solid waste management in terms of recycle is regularly practiced by the members of student organization.

Table 3. Mean in Practices on Solid Waste Management of Students in Terms of Reuse.

Indicator	Mean	Description
1. I reuse my old materials than buying a new one.	3.04	Often Practice
2. I keep those unfilled papers and used it as scratch.	3.26	Always Practice
3. I reuse grocery bags.	3.34	Always Practice
4. I reuse washable food containers	3.37	Always Practice
5. I reuse scrap paper into memo pads.	2.69	Often Practice
Average	3.14	Often Practice

Table 4. Mean in the Practices on Solid Waste Management in Terms of Recycle of the Students.

Indicator	Mean	Description
1. I convert or redesign waste materials into a new product.	2.79	Often Practice
2. I make decors out of plastic wrappers.	2.59	Often Practice
3. I value the importance of recycling.	3.15	Often Practice
4. I initiate generating-income out of waste materials.	2.7	Often Practice
Average	2.81	Often Practice

Practices on solid waste management in terms of disposal

Table 5 shows the mean in the practices on solid waste management in terms of disposal. The student-respondents claimed that their practices on disposal is often practice in all the following indicators: in throwing and left their garbage in designated places with a mean of (X=3.12), in not burning waste materials (X=3.05), placing waste materials in an appropriate container (X=3.15), disposing biodegradable wastes into a compost pit (X=2.92), and disposing hazardous wastes such as laboratory leftover (chemicals) in the right container (X=2.85).On the average, the obtained mean in the practices on solid waste management in terms of disposal is (X=3.02) described as often practiced.

Table 5. Mean in the Practices on Solid Waste management in Terms of Disposal.

Indicator	Mean	Description
1. I throw and left my garbage in designated places.	3.12	Often Practice
2. I don't burn waste materials.	3.05	Often Practice
3. I place waste materials in an appropriate container.	3.15	Often Practice
4. I dispose biodegradable wastes into a compost pit.	2.92	Often Practice
5. I dispose hazardous wastes such as laboratory leftover (chemicals) in the right container.	2.85	Often Practice
Average	3.02	Often Practice

This data revealed that the practice on solid waste management of students in relation to disposal is continuous just like the other indicators.In the study made by (Busalla, 2011) wherein when student are involve in the waste management program an effective and sustainable implementation of the waste management practices are achieved. Moreover, the faculty are the promoters and must be the leaders of the school's waste management program in order for the students to follow.

Average means on the ecological waste management practices

Table 6 shows the average mean in the practices on solid waste management.

The obtained means in the practices on solid waste management are: (X=3.17) in segregation, (X= 3.12) in reduce, (X=3.14) in reuse, (X=2.81) in recycle, and (X=3.02) in disposal which are all described as often practiced. The table also revealed that the highest mean obtained was in the segregation(X=3.17), while the lowest, was in recycle (X=2.81 Segregation got the highest mean and this can be justified with the presence of the different garbage bins and containers found in the respective schools in General Santos City. However, recycling got the lowest mean among the different indicators. This can be inferred that there should be a strengthened program and activities that would address on the concerns on recycling practices among students.).

Table 6. Average Mean in the Practices on Solid Waste Management.

Indicator	Mean	Description
1. Segregation	3.17	Often Practice
2. Reduce	3.12	Often Practice
3. Reuse	3.14	Often Practice
4. Recycle	2.81	Often Practice
5. Disposal	3.02	Often Practice
Average	3.05	Often Practice

On the overall, the obtained mean in the practices on solid waste management is (X=3.05) which described as often practice. This result justified that the practices on solid waste management of students are being implemented in schools in relation to Section 55-56 of Republic Act 9003 or The Ecological Solid Waste Management Act.

Conclusion

This study disclosed the following as its finding: members of the students' organization Youth for Environment Student Organization (YES – O) had high practices on ecological solid waste management in terms of segregation, reduction, reuse, recycling and disposal.

On the basis of the findings of this study, the following conclusions are drawn: The Student Organization YES – O has achieved one of its goals in the implementation of effective solid waste management program. The organization has a very agreeable performance on segregation, reduce, reuse and disposal in their respective schools. Moreover, it can be concluded that ecological waste management practices in terms of recycling needs to be addressed and be given attention to.

Thus, it is recommended that for recycling to be functional and effective, the coordinators and officers of the organization must establish seminars and trainings to address the concern on recycling.

It is also recommended that officers and members of this organization should lead operations to have sustainable practices on ecological solid waste management. Students should maintain appreciable practices on Ecological Solid Waste Management by attending seminars and orientations. And lastly, the school administration should show support for sustaining the program through efficient annual plan of action.

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