

Awareness and Implementation of Solid Waste Management (SWM) Practices

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Abstract

This research used the descriptive-correlational method to determine the level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices in District 2, Bayawan City Division, Negros Oriental, Philippines for SY 2018-2019 in terms of the areas of segregation, reduce, reuse, recycle, and disposal. The quantitative data were gathered from 81 teachers and 189 students. Also, a survey questionnaire was utilized by the researcher. The statistical tools used in the analysis of the data were weighted mean, mean, and spearman rank correlation. The results revealed that the level of respondents' awareness on SWM Practices as both perceived by the teachers and students were very high and the extent of implementation of these practices were very great. In addition to this, a significant relationship was noted between the levels of awareness and extents of implementation of SWM Practices. It can be concluded that the level of awareness greatly influenced the extent of implementation of SWM Practices by the teachers and students in District 2, Bayawan City Division.

Keywords: *Solid Waste Management (SWM) Practices, Level of Awareness, Extent of Implementation*

I. INTRODUCTION

Section 55-56 of Republic Act 9003 or The Ecological Solid Waste Management Act stipulates that the Philippine National Government in coordination with Department of Education (DepEd) and other educational institutions should conduct a continuing education and information campaign on Solid Waste Management (SWM) Practices and strengthen the integration of environmental concerns in school curricula at all extents, with particular emphasis on the theories and practices of waste management principles like segregation at source, reduction, recycling, reuse and composting, in order to promote environmental awareness and action among the citizenry. This in turn promotes growing awareness on SWM Practices by that of the general public.

Solid Waste Management (SWM) is the collection, transport or disposal and treatment of waste materials (Paghasian, 2017). It relates to materials produced through human activities, and the process generally undertaken to endure its effects on health, environment and aesthetics. Recognizing the effects of improper management, garbage crisis can be prevented by practicing

waste characterization and segregation at source, proper collection and transfer, recycling, and composting as mandated by the law (Aquino, et al., 2013). In view thereof, like growing awareness, proper implementation should be given equal focus and attention.

Moreover, as our ecological environment from local setting to the global village has been facing waste crisis due to a number of factors attributed to it, Solid Waste Management (SWM) practices should be strengthened (Pham, 2014; Choi, 2016). Further, awareness of Solid Waste Management (SWM) practices created change on how people look at garbage (Sarino, 2014). Awareness accompanied by participation is the key for people to be involved in the waste management programs of the community where effective and sustainable implementation of the proper waste management practices could be achieved (Punongbayan, 2014).

In the same manner, it is important for our learners to be highly aware and to properly implement SWM practices as the future citizens of this planet as well actively participate in solving environmental related problems as this is regarded a global concern. They foster potential roles in addressing environmental problems as agents of change, future custodians of the planet, and environment managers and developers (Niekerk, 2014). Hence, waste prevention and public participation through proper education with correct information are important factors for future generations (Villanueva, 2013; Marelllo & Helwege, 2014).

In this connection, the researcher has decided to pursue this study with the aim to determine the level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices in District 2, Bayawan City Division. In addition, this study attempted to find out whether or not Solid Waste Management (SWM) Practices positively contributed to the community and the city as a whole.

II. METHODOLOGY

Research Design

The study used the descriptive-correlational research design. The researcher determined the level of respondents' awareness and the extent of implementation of Solid Waste Management (SWM) Practices. Thus, the descriptive and correlational methods were the appropriate designs for the study.

Research Respondents

The respondents of the study for both the level of awareness and the extent of implementation of Solid Waste Management (SWM) Practices were the 81 out of a total of 101 teachers and 189 out of a total of 359 Grade VI Pupils of the different Public Elementary Schools of District 2, Bayawan City Division during the school year 2018-2019.

Research Procedure

The researcher asked permission from the concerned authorities, and secure the necessary endorsements before administering the questionnaires to gather the needed data. A letter of permission to conduct the study was given to the Schools Division Superintendent of the Division of Bayawan City requesting permission to allow the researcher to conduct the study in the different Public Elementary Schools of District 2. Upon approval, copies of the approved letter were given to the assigned Public Schools District Supervisor and also to the school heads, SWM Coordinators, and teachers of the participating schools to allow the researcher to administer the questionnaire to the identified research respondents.

Plan for Data Analysis

The data gathered were processed statistically using the Statistical Package for Social Science (SPSS). These were statistically analysed to answer the specific objectives of the study such as mean to determine the level of awareness on Solid Waste Management (SWM) Practices and Spearman Rank Correlation to determine whether or not significant relationship exists between the level of respondents’ awareness and extent of implementation of Solid Waste Management (SWM) Practices.

III. RESULTS AND DISCUSSION

This section presents the result of the study and provides in-depth analysis and interpretation of data.

Table 1
Profile of the Respondents in Terms of the Variables

| Variables | Categories | Teachers | | Students | |
|--------------------|------------|----------|------|----------|------|
| | | n | % | n | % |
| 1. Sex | Male | 5 | 6.2 | 87 | 46 |
| | Female | 76 | 93.8 | 102 | 54 |
| 2. Size of School | Smaller | 44 | 54.3 | 91 | 48.1 |
| | Bigger | 37 | 45.7 | 98 | 51.9 |
| 3. School Location | Banga | 41 | 50.6 | 94 | 49.7 |
| | Malabugas | 19 | 23.5 | 56 | 29.6 |
| | Nangka | 9 | 11.1 | 15 | 7.9 |
| | Pagatban | 12 | 14.8 | 24 | 12.7 |

The first objective of this study was to present the profile of the respondents according to selected variables. Table 1 presents the profile of the teachers and the students according to the selected variables, namely: sex, size of school, and school location.

With regards to sex, male and female respondents were included in the study. Of the 81 teacher-respondents, 5 are male teachers who comprise the 6.2 percent of the population while

76 are female which comprise the 93.8 percent of the population. It can be gleaned from the results that there are more female respondents than the males. The findings only prove that the females outnumber the males sex simply because of the nature of the work of the teaching profession. On the other hand, of 189 student respondents, 87 are male students who compose the 46 percent while 102 are female which comprise the 54 percent of the population. In these findings, it can be gleaned that the male respondents are of almost the same percentage of the female respondents.

Size of school, meanwhile, was categorized into smaller and bigger schools. For teacher-respondents, 44 teachers or 54.3 percent of the population are teaching in smaller schools while 37 teachers or 45.7 percentage delivering instructions in bigger schools. Also, for student-respondents, 91 or 48.1 percent of the population are studying in smaller schools while 98 or 51.9 percent of the students are attending bigger schools. This simply suggests that like some schools, districts or divisions, nearly 50 percent of the research respondents, teachers and students, represent both the smaller and bigger sizes of schools of the population.

For the school location, it was arranged through barangays or geographical locations. The table shows that 41 teacher-respondents or 50.6 percent are teaching in schools situated in Brgy. Banga while 94 or 49.7 percent of the students are attending the same schools. Also, 19 teachers or 23.5 percent of the respondents are delivering instructions and 56 students or 29.6 percent of the respondents are studying in schools located in Barangay Malabugas. Furthermore, 9 or 11.1 percent of the teacher-respondents and 15 or 7.9 percent of the student-respondents are attending school within Barangay Nangka. Moreover, for the school located in Brgy. Pagatban, 12 or 14.8 percent are teacher-respondents while 24 or 21.7 percent of the population are students.

Table 2

Level of Respondents' Awareness on Solid Waste Management (SWM) Practices in terms of the Areas

| Areas | Teachers | | Students | |
|--|-------------|------------------------|-------------|------------------------|
| | Mean | Interpretation | Mean | Interpretation |
| Segregation | | | | |
| Segregation of biodegradable (paper, banana peels, cardboard, food wastes, leaves, twigs, and vegetables) and non biodegradable (plastic toys, glass, steel, rubber) wastes at school. | 4.88 | Very High Level | 4.90 | Very High Level |
| Separation of recyclable wastes (paper, cardboard, plastic bottles) from non recyclable or residuals which have no potential for reuse and recycling (sando bags, napkins, diapers, ball pens, etc.) | 4.83 | Very High Level | 4.81 | Very High Level |
| Separation of non harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others. | 4.85 | Very High Level | 4.77 | Very High Level |
| Separation and segregation of garbage in different containers. | 4.91 | Very High Level | 4.85 | Very High Level |
| Segregation of recyclable items for collection. | 4.85 | Very High Level | 4.65 | Very High Level |
| Mean | 4.86 | Very High Level | 4.80 | Very High Level |
| Reduce | | | | |
| Borrowing, sharing, and/or renting things that are needed occasionally. | 4.27 | Very High Level | 3.93 | High level |
| Buying only what is needed so that one will not end up throwing away extra food. | 4.65 | Very High Level | 4.43 | Very High Level |
| Packing lunch in reusable lunchbox so that one cannot buy wrapped/packed food at school | 4.73 | Very High Level | 4.70 | Very High Level |
| Buying water in reusable water bottles than buying water in one used plastic bottles at the school. | 4.88 | Very High Level | 4.61 | Very High Level |
| Being cautious and responsible to every waste one produce. | 4.79 | Very High Level | 4.72 | Very High Level |
| Mean | 4.66 | Very High Level | 4.48 | Very High Level |
| Reuse | | | | |
| 1. Reusing old materials than buying a new one. | 4.52 | Very High Level | 4.79 | Very High Level |
| 2. Keeping those unfilled papers and using it as scratch. | 4.58 | Very High Level | 4.72 | Very High Level |
| 3. Reusing grocery bags. | 4.68 | Very High Level | 4.77 | Very High Level |
| 4. Reusing washable food containers. | 4.65 | Very High Level | 4.92 | Very High Level |
| 5. Reusing scrap paper into memo pads. | 4.59 | Very High Level | 4.64 | Very High Level |
| Mean | 4.60 | Very High Level | 4.77 | Very High Level |
| Recycle | | | | |
| 1. Redesigning waste materials into a new product. | 4.31 | Very High Level | 4.54 | Very High Level |
| 2. Making decors out of plastic wrappers and other colorful waste materials. | 4.30 | Very High Level | 4.58 | Very High Level |
| 3. Promoting the importance of recycling. | 4.72 | Very High Level | 4.80 | Very High Level |
| 4. Initiating income generating activities out of waste materials. | 4.41 | Very High Level | 4.66 | Very High Level |
| 5. Using recycled products out of redesigned waste materials. | 4.43 | Very High Level | 4.56 | Very High Level |
| Mean | 4.43 | Very High Level | 4.63 | Very High Level |
| Disposal | | | | |
| 1. Throwing and leaving of garbage anywhere. | 3.81 | High Level | 4.06 | High Level |
| 2. Burning of waste materials. | 3.94 | High Level | 3.79 | High Level |
| 3. Throwing of waste materials in common open dumps. | 4.20 | High Level | 3.58 | High Level |
| 4. Disposal of biodegradable wastes into a compost pit. | 4.89 | Very High Level | 4.88 | Very High Level |
| 5. Disposal of hazardous/ toxic/special wastes such as laboratory leftover (chemicals) or electronic waste in any garbage container. | 3.99 | High Level | 3.69 | High Level |
| Mean | 4.17 | High Level | 4.00 | High Level |
| Overall Mean | 4.55 | Very High Level | 4.53 | Very High Level |

The level of respondent' awareness on Solid Waste Management (SWM) Practices according to the areas as perceived by teachers and students respectfully resorted to the overall mean scores of 4.55 and 4.53 interpreted as "very high" level.

When items were taken individually, area of segregation obtained the highest mean score with 4.86 for teachers and 4.80 for students categorized as “very high” level. There is only a slight difference of 0.06 with the teachers’ awareness with that of the students. The result simply suggests that there is a high transfer of learning from the teachers to the students on the area of segregation as an SWM practice. The results further simply proven the importance of the subjects taken by the students like science and other environmental courses which include topics of the environment and solid waste management in its curricular aspects to further intensify environmental consciousness (Ahmad et al., 2015).

On the area of reduce, both teachers and students demonstrated “very high” level of awareness with overall mean scores of 4.66 and 4.48 respectively. However, from among the indicators in the area of reduce, students demonstrate only “high” level of awareness on indicator 1 on “borrowing, sharing, and/or renting things that are needed occasionally” as compared to “very high” level of awareness on the rest of the practices. This can be attributed to the situations needed occasionally where students find it hard to borrow from others or share things to others as well as rent things themselves due to being economically-challenged or the lack of financial resources (Arevalo & Comighud, 2020).

On the area of reuse, on the other hand, both of the respondents displayed “very high” level of awareness with 4.60 and 4.77 mean respectively for the teachers and students. For recycle, both of the respondents also displayed “very high” level of awareness with 4.43 for the teachers and 4.63 for the students. A slight difference of 0.17 on reuse and 0.20 on recycle can be noted between the respondents as the students displayed higher level of awareness on both areas than the teachers. This can be attributed that the students realize more its value as they have the greater needs to reuse and recycle things for future use or to be economically-wise and highly aware on the importance of these resources to aid their daily school needs (Comighud & Arevalo, 2020; Arevalo & Comighud, 2020; Lalamonan & Comighud, 2020).

Meanwhile, for the area of disposal, the respondents both demonstrate “very high” level of awareness with 4.17 for the teachers and 4.00 for the students. Hence, educating people to waste management will help them understand of the indiscriminate disposal of waste to the environment and human health and empower them to act accordingly (Madrigal & Oracion, 2018).

Table 3

Extent of Respondents' Implementation of Solid Waste Management (SWM) Practices in terms of the Areas

| Areas | Teachers | | Students | |
|---|-------------|--------------------------|-------------|--------------------------|
| | Mean | Interpretation | Mean | Interpretation |
| Segregation | | | | |
| 1. Segregation practice is evident in classrooms, offices and canteen. | 4.81 | Very Great Extent | 4.86 | Very Great Extent |
| 2. Waste is segregated into at least two types. | 4.86 | Very Great Extent | 4.89 | Very Great Extent |
| 3. Receptacle for special waste is necessary wherever applicable. | 4.68 | Very Great Extent | 4.65 | Very Great Extent |
| 4. No unmanaged waste receptacles outside the classrooms. | 4.68 | Very Great Extent | 4.50 | Very Great Extent |
| 5. MRF is available. | 4.73 | Very Great Extent | 4.62 | Very Great Extent |
| Mean | 4.75 | Very Great Extent | 4.70 | Very Great Extent |
| Reduce | | | | |
| 1. Avoidance of use of plastics in canteen. | 4.10 | Great Extent | 4.40 | Very Great Extent |
| 2. No more plastics used as secondary packaging material. | 4.00 | Great Extent | 4.17 | Very Great Extent |
| 3. Most foods are packed using biodegradable materials. | 4.15 | Great Extent | 4.29 | Very Great Extent |
| 4. Orient school canteen vendors on plastic avoidance policy. | 4.60 | Very Great Extent | 4.72 | Very Great Extent |
| 5. Implement DepEd-Bayawan City's policy on plastic avoidance in canteens. | 4.68 | Very Great Extent | 4.80 | Very Great Extent |
| Mean | 4.31 | Very Great Extent | 4.48 | Very Great Extent |
| Reuse | | | | |
| 1. Composting of biodegradable waste. | 4.62 | Very Great Extent | 4.62 | Very Great Extent |
| 2. Actual application of compost in gardening. | 4.54 | Very Great Extent | 4.52 | Very Great Extent |
| 3. Reuse used tires as decorative flower pots. | 4.72 | Very Great Extent | 4.70 | Very Great Extent |
| 4. Use of compost products or soil from the compost pit were used in the garden. | 4.69 | Very Great Extent | 4.53 | Very Great Extent |
| 5. Re-use practices are evident. | 4.65 | Very Great Extent | 4.71 | Very Great Extent |
| Mean | 4.64 | Very Great Extent | 4.61 | Very Great Extent |
| Recycle | | | | |
| 1. Recover and recycle papers (pots, charcoal, etc). | 4.56 | Very Great Extent | 4.52 | Very Great Extent |
| 2. Plastic waste turned into pillows as one of the examples. | 4.58 | Very Great Extent | 4.72 | Very Great Extent |
| 3. Drinking straws and popsicle sticks made into tiny houses among others. | 4.30 | Very Great Extent | 4.66 | Very Great Extent |
| 4. Products out of recyclable materials show promise (profit, utility) | 4.58 | Very Great Extent | 4.51 | Very Great Extent |
| 5. MRF is available. | 4.65 | Very Great Extent | 4.67 | Very Great Extent |
| Mean | 4.53 | Very Great Extent | 4.62 | Very Great Extent |
| Disposal | | | | |
| 1. Proper disposal of special wastes. | 4.84 | Very Great Extent | 4.87 | Very Great Extent |
| On site establishment of composting facilities for biodegradable wastes (any of these: compost pit, vermin compost, etc.) | 4.74 | Very Great Extent | 4.64 | Very Great Extent |
| Proper observance of collection schedules for specific category of segregated solid wastes. | 4.93 | Very Great Extent | 4.93 | Very Great Extent |
| Designate drop-off center/ MRF (ideal, sturdy, labeled, actual sales recyclable waste). | 4.81 | Very Great Extent | 4.85 | Very Great Extent |
| Residual waste due for collection is inside sacks to facilitate collection by the LGU. | 4.81 | Very Great Extent | 4.93 | Very Great Extent |
| Mean | 4.83 | Very Great Extent | 4.84 | Very Great Extent |
| Overall Mean | 4.61 | Very Great Extent | 4.65 | Very Great Extent |

Table 3 indicates the extent of respondents’ implementation of Solid Waste Management (SWM) Practices in terms of the areas such as segregation, reduce, reuse, recycle, and disposal.

The table shows the overall mean scores obtained by the teachers and students are 4.61 and 4.65 respectively. These are interpreted to have “very great” extent. This implies a positive transfer of learning from the teachers to the students who are regarded as the key agent of change to work towards a more sustainable future through improving their knowledge on waste management (Niekerk, 2014).

The findings of this study is further reinforced by the research of Ahmad et al. (2015) on how curricular aspect further intensity environment consciousness as a response of teachers and students to waste problems in the school setting. In addition, as a learning institution, it is then the nature of the school to provide transformational learning experiences that promote environmental sustainability within and across school contexts to put forward educators’ role in helping students gain experience that protect the environment from the classroom to the extended community and along its similarities, promote environmental programs that are integral the to school’s educational mission. Active participation of the members of the academic community is important for the implementation of its institutional programs and for environmental protection and sustainable development in order to foster new generation of environmental leaders (Madrigal & Oracion, 2018).

Table 4. Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on the Area of Segregation when Respondents are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.79 | 7181.5 | 0.05 | 0.59 | Not Significant |
| | Female | 4.83 | | | | |
| Size of School | Smaller | 4.82 | 8951 | 0.05 | 0.774 | Not Significant |
| | Bigger | 4.81 | | | | |
| School Location | Banga | 4.86 | 18.98 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.70 | | | | |
| | Nangka | 4.91 | | | | |
| | Pagatban | 4.83 | | | | |

Table 4 shows the significant difference between the level of awareness on SWM Practices on the area of segregation when respondents are grouped and compared according to selected variables of sex, size of school and school location.

When grouped and compared according to sex, the results showed that the computed p-value of 0.59 is higher than the level of significance at 0.05. Thus, the hypothesis of no significant difference is not rejected. This simply means that the sex is not a determining factor in the level of respondents' awareness in the area of segregation. It makes a lot of sense to say that the respondents, whether male or female, demonstrate similar level of awareness on segregation aspect. This is contrasted by the findings of Malabarbas (2014) that there was significant relationship between the level of awareness of the respondents on SWM Practice in terms of sex.

When grouped according to the size of school, the computed p-value of 0.774 is also higher than the level of significance of 0.05. The hypothesis of no significant difference on the level of awareness of respondents on the area of segregation is therefore not rejected. This implies that whether small or big, it is not an intervening factor to display high level of awareness on segregation. Both displays higher level of knowledge and awareness on segregation as a SWM Practices. Regardless of the size of the school, teachers perform the same roles and functions on orienting their students for the effective practice on the segregation of waste materials. This is affirmed by Massive et al. (2014) that regardless of the size of school, it is still the level of education that served as good indicators to the willingness and participation of the people.

When grouped according to the school location, the computed p-value of 0.000 which is depicted as significant. This implied that the different degree of regulations of barangay locations of the different schools is a contributory factor in the area of segregation of waste such as biodegradable and non-biodegradable.

Table 5. Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on the Area of Reduce when Respondents are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.51 | 7736 | 0.05 | 0.45 | Not Significant |
| | Female | 4.55 | | | | |
| Size of School | Smaller | 4.56 | 8875 | 0.05 | 0.707 | Not Significant |
| | Bigger | 4.51 | | | | |
| School Location | Banga | 4.69 | 65.68 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.20 | | | | |
| | Nangka | 4.64 | | | | |
| | Pagatban | 4.57 | | | | |

Table 5 signifies the comparative statistics on the significant differences between the level of awareness on SWM Practices on the area of reduce when the respondents are grouped and compared according to the selected variables of sex, size of school and school locations.

As to sex variable, the male respondents perceived a mean rank of 4.51 while the female respondents perceived a mean rank of 4.55. This indicates that male respondents are almost of the same manner with their female counterparts towards the area of reduce. Based on the findings, there is no significant difference in the level of awareness of the respondents on SWM practice o the area of reduce. Hence, this implies that sex does not affect the level of respondents’ awareness in the area of reduce as an SWM practice.

Table 5 alsodescribes the statistics of the computed p-value to determine the significant difference in the level of awareness on the area of reduce when grouped according to the size of the school. The computed p-value is 0.707 which is bigger than 0.05 significant levels implied that the difference between the compared groups is not significant. Based on the findings, there is no significant difference on the level of awareness on the area of reduce as perceived by smaller and bigger schools. This implies that the size of schools does not affect the level of awareness on SWM Practice on the area of reduce. This finding in the abovementioned, both of the variables of sex and size of school can be attributed to the study of Barloa et al. (2014) that the inclusion of relevant topics in the curriculum with emphasis on SWM is the one considered important to promote growing awareness on Solid Waste Management issues regardless of the sex and size of school.

The statistics p-value is also presented to determine the significant difference on the level of awareness on SWM Practice on the area of reduce when group according to school location. The p-value is 0.000 and is considered significant. Based on the findings, there is significant difference in the level of respondents’ awareness in the area of reduce when grouped and compared according to the aforementioned variables. As Villanueva (2013) noted, education is an important confinement of solid waste management that should be present to establish a good program in the community as a setting of different school locations.

Table 6. *Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on the Area of Reuse when Respondents are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|------------------|-------------------|-------------|-----------------------|------------------------------|----------------|---------------------|
| Sex | Male | 4.75 | 8157 | 0.05 | 0.957 | Not Significant |
| | Female | 4.70 | | | | |
| Size of School | Smaller | 4.62 | 6504 | 0.05 | 0.000 | Significant |
| | Bigger | 4.82 | | | | |
| School Location | Banga | 4.75 | 10.16 | 0.05 | 0.017 | Significant |
| | Malabugas | 4.71 | | | | |
| | Nangka | 4.71 | | | | |
| | Pagatban | 4.64 | | | | |

Table 6 displays the significant difference on the level of respondents’ awareness on SWM Practice on the area of reuse when respondents are grouped and compared according to variable of sex, size of school and school location.

On sex variable, the computed p-value is 0.957 which is higher than the level of significance of 0.05. Thus, the hypothesis of no significant difference on the level of awareness on the area of reuse according to male and female teachers and students is not rejected as they have almost the same level of awareness on this SWM practice. This is in contrast to the findings of Amit and Malarbarbas (2014) who noted that there is a significant difference on the level of awareness on SWM Practices in terms of sex.

When the size of school is taken as a variable, the computed p-value is 0.000 and is considered significant. Hence, there is a significant difference in the area of reuse on smaller and bigger schools. From this, there is an indication that the size of school, especially the number of student population given education on solving environment issues is a determinant factor on the rate of transfer of learning to students to develop good practices and improve attitude towards solid waste management (Abella & Balla, 2013).

As for the school location, the computed p-value of 0.017 is also considered significant. This implies that there is significant difference on the level of awareness when respondents are grouped and compared according to school locations. From this result, it is obvious that the level of education of the people in different school locations is a good indicator for their degree and willingness of participation (Massave et al. 2014; Comighud, 2019; Arevalo & Comighud, 2020).

Table 7. *Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on the Area of Recycle when Respondents are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.63 | 7272.5 | 0.05 | 0.139 | Not Significant |
| | Female | 4.54 | | | | |
| Size of School | Smaller | 4.50 | 7217 | 0.05 | 0.003 | Significant |
| | Bigger | 4.64 | | | | |
| School Location | Banga | 4.60 | 4.708 | 0.05 | 0.194 | Not Significant |
| | Malabugas | 4.48 | | | | |
| | Nangka | 4.68 | | | | |
| | Pagatban | 4.56 | | | | |

Table 7 presents the comparative statistics on the significant differences between levels of awareness on SWM Practices on the area of recycle when the respondents are grouped and compared according to the selected variables of sex, size of school, and school locations.

As to sex variable, the male respondents perceived a mean rank of 4.63 while the female respondents perceived a mean rank of 4.54. This indicates just a slight difference with the level

of awareness of male and female respondents in the area of recycle. Based on the findings, there is no significant difference in the level of awareness of the respondents on SWM practice on the area of recycle. This implies that sex does not affect the level of respondents' awareness in the area of recycle as an SWM practice. This is contrasted by the study of Adelou, Enesi and Adelou (2014) that like students' age and class, students' sex influenced their level of SWM awareness, knowledge and practice.

Table 7 also presents the statistics of the computed p-value to determine the significant difference in the level of awareness on the area of recycle when grouped according to the size of school. The computed p-value is 0.003 which is lower than 0.05 significant level, thus, the difference between compared groups is considered significant. Based on the findings, there is a significant difference on the level of awareness on the area of recycle as perceived by smaller and bigger schools when grouped according to the size of school. This implies that size of schools affect the level of awareness on SWM Practice on the area of recycle. This is supported by the findings of Pham (2014) that the size of school is said to be significant since the number of student population receiving orientation on environmental issues and its corresponding solutions affects the respondents' level or degree of focus.

The statistics p-value is also presented to determine the significant difference on the level of awareness on SWM Practice on the area of recycle when group according to school location. The p-value is 0.194 and is considered not significant as it is higher than the significant level of 0.05. Based on the findings, there is no significant difference in the level of respondents' awareness in the area of recycle when grouped and compared according to selected variables. This is supported by Niekerk (2014) that children were obviously aware with waste and waste management practices in their school settings and local environment regardless of the fact that they are situated in different places.

Table 8. *Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on the Area of Disposal when Respondents are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|--------------|
| Sex | Male | 3.91 | 6738 | 0.05 | 0.017 | Significant |
| | Female | 4.12 | | | | |
| Size of School | Smaller | 3.68 | 4023.5 | 0.05 | 0.000 | Significant |
| | Bigger | 4.42 | | | | |
| School Location | Banga | 4.09 | 29.505 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.31 | | | | |
| | Nangka | 3.58 | | | | |
| | Pagatban | 3.67 | | | | |

Table 8 reflects the significant difference on the level of respondents’ awareness on SWM Practices on the area of disposal when respondents are grouped and compared according to selected variables of sex, size of school, and school location.

On sex variable, the computed p-value is 0.017 which is lower than the level of significance of 0.05. Thus, the hypothesis of no significant difference on the level of awareness on the area of disposal according to male and female teachers and students is rejected as they have almost the same level of awareness on this SWM practice. This is substantiated by the findings of Amit and Malarbarbas (2014) that significant relationship exists between the level of awareness of the student-respondents in solid waste management in terms of sex. Also, the finding is affirmed by Adelou, Enesi & Adelou (2014) that students’ sex significantly influenced their level of awareness, knowledge and practice of waste management.

When the size of school is taken as a variable, the computed p-value is 0.000 and is considered significant. Hence, there is a significant difference in the area of disposal on smaller and bigger schools. From this, there is an indication that the size of school, especially the number of student population given education on solving environment issues is a determining factor on the rate of transfer of learning to students to develop good practices and improve attitude towards solid waste management (Abella & Balla, 2013). This is further supported by Niekerk (2014) that children were obviously aware with waste and waste management practices in their schools and local environment.

Also when the school location is taken as a variable, the computed p value is 0.000 and is considered significant. This is the reason why Licy et al. (2013) noted that as parents and community members comprise the school location where students are educated and concepts of SWM are delivered, there is a need for them to be made aware to improve practice on solid waste management. Hence, parents and community members should be given environmental education during parent-teaching meetings or community-based programs to further strengthen and increase level of awareness on SWM Practices.

Table 9. *Differences between the Level of Awareness of Solid Waste Management (SWM) Practices on*

All Areas when Respondents are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.52 | 7476.5 | 0.05 | 0.271 | Not Significant |
| | Female | 4.55 | | | | |
| Size of School | Smaller | 4.44 | 4888.0 | 0.05 | 0.000 | Significant |
| | Bigger | 4.64 | | | | |
| School Location | Banga | 4.60 | 9.362 | 0.05 | 0.25 | Not Significant |
| | Malabugas | 4.48 | | | | |
| | Nangka | 4.50 | | | | |
| | Pagatban | 4.45 | | | | |

Table 9 signifies the significant difference on the level of awareness on Solid Waste Management (SWM) Practices on all Areas when respondents are grouped and compared according to variables of sex, size of school and school location.

On sex variable, the computed p-value is 0.271 which is higher than the level of significance of 0.05. Thus, the hypothesis of no significant difference on the level of awareness on all areas when respondents are grouped according to male and female is therefore not rejected. Hence, teachers and students have almost the same level of awareness in this aspect. This is affirmed by the findings of Martin and Tillotson (2015) who indicated that regardless of sex or who are engaged in SWM practice, what is important is why the management is implemented and what the management accomplishes.

When the size of school is taken as a variable, the computed p-value is 0.000 and is considered significant. Hence there is a significant difference on the level of awareness on all areas when respondents are grouped according to size of schools, smaller and bigger. In affirmation, Ahmad et al. (2015) put forward the essence of reinforcing curricular aspect and further intensifying institutional initiatives aimed at forming all members of the academic community as “advocates of sustainable development”.

The statistics p-value is also presented to determine the significant difference on the level of awareness on SWM Practice on all areas when respondents are grouped and compared according to school location. The p-value is 0.25 which is considered not significant. Based on the findings, it affirmed the statement of Villanueva (2013) that it is not the school location but the level of education which should be present to establish a good program for the community on environmental issues for sustainable future.

Table 10. Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on the Area of Segregation when Respondents Are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.75 | 7687 | 0.05 | 0.372 | Not Significant |
| | Female | 4.70 | | | | |
| Size of School | Smaller | 4.79 | 7373.5 | 0.05 | 0.003 | Significant |
| | Bigger | 4.65 | | | | |
| School Location | Banga | 4.81 | 57.349 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.47 | | | | |
| | Nangka | 5.00 | | | | |
| | Pagatban | 4.71 | | | | |

Table 10 presents the significant difference on the extent of implementation of SWM Practices on the area of segregation when respondents are grouped and compared according

to variable of sex, size of school and school location. On sex variable, the computed p-value is 0.372 which is higher than 0.05 level of significance. Hence, the extent of implementation of SWM Practices on the area of segregation according to male and female teachers and students is not significant. This is in contrast to the findings of Amit and Malarbarbas (2014) that there is a significant difference on the level of awareness on SWM Practices in terms of sex. When the size of school is taken as a variable, the computed p-value is 0.003 which is considered significant. Hence, there is a significant difference in the area of segregation on smaller and bigger schools. Thus, the size of school is a determining factor in integrating school’s educational mission. Moreover, active participation of the members of the academic community is important in its institutional programs for environmental protection and sustainable development (Madrigal & Oracion, 2018). As for the school location, the computed p-value of 0.000 is also considered significant. This implies that there is a significant difference on the extent of implementation when respondents are grouped and compared according to school location. Niekerk (2014) further indicated that regardless where the school is located, school children are obviously aware on concerns with waste and waste management practices.

Table 11. *Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on the Area of Reduce when Respondents Are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.49 | 7082.5 | 0.05 | 0.65 | Not Significant |
| | Female | 4.39 | | | | |
| Size of School | Smaller | 4.48 | 8357 | 0.05 | 0.232 | Not Significant |
| | Bigger | 4.37 | | | | |
| School Location | Banga | 4.47 | 29.488 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.25 | | | | |
| | Nangka | 4.80 | | | | |
| | Pagatban | 4.39 | | | | |

Table 11 indicates the significant difference on the extent of implementation of SWM Practices on the area of reduce when respondents are grouped and compared according to variable of sex, size of school, and school location. On sex variable, the computed p-value is 0.65 which is higher than 0.05 level of significance. Hence, the extent of implementation of SWM Practices on the area of reduce according to male and female teachers and students is not significant. Karre (2013) on the other hand put more emphasis on the importance of how SWM was introduced and the accomplishment of its results regardless of the sex. When the size of school is taken as a variable, the computed p-value is 0.232 which is considered not significant. As Barloa et al. (2014) noted, that it is not the size of school but the inclusion of relevant topics with emphasis on proper SWM and other solid waste issues in the curriculum that matters in

order to promote awareness on environmental issues and improve attitude towards environmental sustainable solutions. As for the school location, the computed p-value of 0.000 which is considered significant. This implies that there is a significant difference on the extent of implementation of SWM Practices on the area of reduce when respondents are grouped and compared according to school location. Given the context, educating people will help them understand proper solid waste management for sustainable environmental practices (Madrigal & Oracion, 2018).

Table 12. *Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on the Area of Reuse when Respondents Are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.62 | 7955.5 | 0.05 | 0.806 | Not Significant |
| | Female | 4.62 | | | | |
| Size of School | Smaller | 4.60 | 8285.5 | 0.05 | 0.219 | Not Significant |
| | Bigger | 4.65 | | | | |
| School Location | Banga | 4.77 | 54.844 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.44 | | | | |
| | Nangka | 4.58 | | | | |
| | Pagatban | 4.48 | | | | |

Table 12 displays the significant difference on the extent of implementation of SWM Practices on the area of reuse when respondents are grouped and compared according to variable of sex, size of school and school location. On sex variable, the computed p-value is 0.806 which is higher than 0.05 level of significance. Hence, the extent of implementation of SWM Practices on the area of reuse according to male and female teachers and students is not significant. It has been indicated that what’s more important is how SWM was introduced and the accomplishment of its results regardless of the sex (Hulman, 2013). When the size of school is taken as a variable, the computed p-value is 0.219 which is considered not significant. As Niekerk (2014) noted that regardless of the size of school, children should work towards sustainable future. Furthermore, regardless of the size of school, education is provided to improve knowledge and contribute to increase environmental awareness. As for the school location, the computed p-value of 0.000 which is considered significant. This implies that there is significant difference on the extent of implementation of SWM Practices on the area of reduce when respondents are grouped and compared according to school location. This is supported by the study of Choi (2016) who worked into the concept of environmental effectiveness as to structural indicator.

Table 13. Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on the Area of Recycle when Respondents Are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.65 | 7344.0 | 0.05 | 0.150 | Not Significant |
| | Female | 4.56 | | | | |
| Size of School | Smaller | 4.66 | 8049 | 0.05 | 0.086 | Not Significant |
| | Bigger | 4.52 | | | | |
| School Location | Banga | 4.80 | 93.445 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.17 | | | | |
| | Nangka | 4.73 | | | | |
| | Pagatban | 4.62 | | | | |

Table 13 reflects the significant difference on the extent of implementation of SWM Practices on the area of recycle when respondents are grouped and compared according to variable of sex, size of school, and school location. On sex variable, the computed p-value is 0.150 which is higher than 0.05 level of significance. Hence, the extent of implementation of SWM Practices on the area of recycle according to male and female teachers and students is not significant. This is contrasted by the findings of the study of Amit and Malabarbas (2014) when they indicated that significant relationship exists on the level of participation of the respondents to SWM practices in terms of sex. When the size of school is taken as a variable, the computed p-value is 0.086 which is also considered not significant. Regardless of the size of schools, academic area component is promoted to integrate environmental areas on all subject areas especially implementing SWM properly in school (Arabaca et al., 2013). As for the school location, the computed p-value of 0.000 which is considered significant. This implies that there is significant difference on the extent of implementation when respondents are grouped and compared according to school location. This is supported by the study of Licy et al. (2013) that parents as part of the community should therefore be given environmental education.

Table 14. Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on the Area of Disposal when Respondents Are Grouped and Compared According to Selected Variables

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.87 | 7352.0 | 0.05 | 0.125 | Not Significant |
| | Female | 4.82 | | | | |
| Size of School | Smaller | 4.85 | 8318.0 | 0.05 | 0.167 | Not Significant |
| | Bigger | 4.83 | | | | |
| School Location | Banga | 4.92 | 95.855 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.69 | | | | |
| | Nangka | 5.00 | | | | |
| | Pagatban | 4.76 | | | | |

Table 14 shows the the significant difference on the extent of implementation of SWM Practices on the area of disposal when respondents are grouped and compared according to variable of sex, size of school, and school location. On sex variable, the computed p-value is 0.125 which is higher than 0.05 level of significance. Hence, the extent of implementation of SWM Practices on the area of segregation according to male and female teachers and students is not significant. Abas and Wee (2014) indicated that regardless of sex, it is good governance practices that will contribute positively for effective implementation of solid waste management. When the size of school is taken as a variable, the computed p-value is 0.167 which is also considered not significant. Massawe et al. (2014) emphasized that regardless of the size of school, it is the level of education that served as good indicators for the degree of willingness and extent of participation. As for the school location, the computed p-value of 0.000 which is considered significant. This implies that there is significant difference on the extent of implementation when respondents are grouped and compared according to school location. Abocejo and Vivar (2015) indicated that there are a lot of human activities that contribute to waste generation. These waste materials if failed to be disposed in the proper manner and in the proper place can create a serious problem to humans and threat to nature.

Table 15. *Differences between the Extent of Implementation of Solid Waste Management (SWM) Practices on All Areas when Respondents Are Grouped and Compared According to Selected Variables*

| Variables | Categories | Mean | U- or H-values | Level of Significance | p-value | Significance |
|-----------------|------------|------|----------------|-----------------------|---------|-----------------|
| Sex | Male | 4.67 | 7399.5 | 0.05 | 0.246 | Not Significant |
| | Female | 4.62 | | | | |
| Size of School | Smaller | 4.68 | 8207.5 | 0.05 | 0.188 | Not Significant |
| | Bigger | 4.60 | | | | |
| School Location | Banga | 4.75 | 88.254 | 0.05 | 0.000 | Significant |
| | Malabugas | 4.40 | | | | |
| | Nangka | 4.82 | | | | |
| | Pagatban | 5.59 | | | | |

Table 15 presents the significant difference on the extent of implementation of Solid Waste Management (SWM) Practices on all Areas when respondents are grouped and compared according to variables of sex, size of school, and school location.

On sex variable, the computed p-value is 0.246 which is higher than the level of significance of 0.05. Thus, the hypothesis of no significant difference on the extent of implementation on all areas when respondents are grouped according to male and female is not rejected. Hence, teachers and students have almost the same extent of implementation in this aspect. This is affirmed by the findings of Martin and Tillotson (2015) who indicate that regardless of sex or who are engaged in SWM practice, what is important is why the management is implemented and what the management accomplishes. This is however contrasted by the findings of Amit

and Malabarbas (2014) as they shared the findings that significant relationship exists in the level of participation of the respondents in terms of sex.

When the size of school is taken as a variable, the computed p-value is 0.188 which is not considered significant. Hence, there is no significant difference on the extent of implementation on the area of disposal of smaller and bigger schools. Regardless of the size of schools, the significant role of education in solid waste management, RA 9003 mandates Philippine learning institutions to integrate into their educational activities the awareness and practices of solid waste management practices of solid waste management for the environmental education of all members of the educational institutions.

The statistics p-value is also presented to determine the significant difference on the extent of implementation on SWM Practice on all areas when respondents are grouped and compared according to school location. The p-value is 0.000 and is considered significant. This is supported by the notion made by Abocejo and Vivar (2015) that R.A. 9003 regardless of the location mandated LGUs to implement policies to promote proper solid waste management program within their jurisdiction, and provide the necessary institutional mechanisms to attain the objectives like minimizing waste by using techniques of recycling, resource recovery, reuse, and composting.

Table 16. *Relationship between the Levels of Awareness and Extents of Implementation of Solid Waste Management (SWM) Practices*

| Variables | Mean | rho | Level of Significance | p-value | Significance |
|---------------------------|------|-------|-----------------------|---------|--------------|
| Levels of Awareness | 4.54 | 0.394 | 0.05 | 0.000 | Significant |
| Extents of Implementation | 4.64 | | | | |

Table 23 shows the significant relationship between the levels of awareness and extents of implementation of Solid Waste Management (SWM) practices.

Since the r-computed value is 0.394 which is greater than the p-value of 0.000 at 0.05 level of significance, the null hypothesis which states that there is no significant relationship between the levels of awareness and extents of implementation is rejected. The result of the study shows that there is a significant relationship between the level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices.

The result further implied that as educational practitioners promote growing awareness on Solid Waste Management (SWM) Practices to the general public (Aquino, 2013; Paghastian, 2017), proper waste management is also highly implemented and strengthened (Pham, 2014; Choi, 2016).

Furthermore, awareness on SWM Practices created change on how people look at garbage (Sarino, 2014) and as it is accompanied by participation, waste management programs became more effective and sustainable implementation has been achieved (Punongbayan, 2014). Moreover, teachers' and students' "very high" level of awareness through proper education of correct information leads to waste prevention (Marello & helwege, 2014) as it also increases public participation as these respondents foster potential roles in addressing environmental issues for both present and future generations toward a sustainable future (Niekerk, 2014).

IV. CONCLUSIONS

On the bases of the foregoing findings of the study, the researcher arrived at the following conclusions:

The level of respondents' awareness on Solid Waste Management (SWM) Practices as both perceived by the teachers & students in terms of the areas of segregation, reduce, reuse, recycle, and disposal were very high. It means that both the teachers and students demonstrated very high level of awareness on Solid Waste Management (SWM) concepts and practices as educational practitioners continue to promote growing awareness of the general public.

The level of respondents' awareness on Solid Waste Management (SWM) Practices in terms of the areas when they are grouped according to sex, size of school, and school location were very high. It can be concluded that teachers and students who comprised as sample of the population regardless of the size of their school and different school locations showed very high level of awareness on environmental issues like waste management as well as sustainable solutions to these problems for SWM programs to be effective and for sustainable future to be achieved.

The extent of respondents' implementation of Solid Waste Management (SWM) Practices in terms of the areas of segregation, reduce, reuse, recycle and disposal were very great. It can be concluded that both teachers and students have very great extent of SWM implementation through proper education and increasing community participation.

The extent of respondents' implementation of Solid Waste Management (SWM) Practices in terms of the areas where they are grouped according to sex, size of the school, and school location were very great. It means that regardless of their sex, whether male or female, size of school as to smaller or bigger, and as to school locations namely Brgy. Banga, Malabugas, Nangka and Pagatban, respondents have very great extent of Solid Waste Management (SWM) Practices implementation for a sustainable ecological solutions as well as active public participation focusing on how SWM is introduced, how it is implemented in different locations, and the how can it accomplished its desired results.

There was no significant difference between the level of awareness on Solid Waste Management (SWM) Practices for all areas when respondents are grouped and compared according to sex and school location but a significant difference exists in the size of the school. This means that regardless of sex and school location, what is important is the inclusion of relevant topics on the curriculum on proper SWM management and other solid waste issues. However, the size of school which corresponds to smaller or bigger number of and serves as a determining factor for the integration of schools' educational mission for the academic community's active participation.

There was no significant difference between the extent of implementation of SWM Practices in all areas when respondents are grouped and compared according to sex and size of the school while a significant difference exists in the school location. Hence, schools across different locations should instil the culture of responsible solid waste management among its children and citizens as the success of any SWM plan rest on the people of the community especially on the degree of willingness and extent of participation.

A significant relationship was noted between the levels of awareness and extents of implementation of Solid Waste Management (SWM) Practices. It can be concluded that the level of awareness greatly influenced the extent of implementation of SWM Practices by the teachers and students in District 2, Bayawan City Division. Hence, as it is awareness on the individual level which can develop into attitudes that will guide schools and communities to sustainable development solutions, it should be strengthened for SWM proper implementation and increase public participation.

V. RECOMMENDATIONS

In the light of the findings and conclusions of the study, the following recommendations are advanced.

The level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices are respectively very high and very great according to all areas. It is therefore recommended that educational institutions just like District 2 and other districts of Bayawan City Division as well as schools and districts of other divisions of the Department of Education should continue to conduct information campaign on Solid Waste Management (SWM) Practices and further strengthen the integration of environmental concerns in school curricula at all extents, with particular emphasis on the theories and practices of waste management principles like segregation at source, reduction, recycling, reuse and composting, in order to promote environmental awareness and action among the citizenry. This in turn promotes growing awareness on SWM Practices by that of the general public.

The level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices when they are grouped according to sex, size of school, and school location were very high. It is therefore recommended that growing awareness on SWM Practices by that of the educational practitioners, teachers and students, should further be increased for the welfare of the general public which in turn shall help strengthen SWM extent

of implementation ensuring active public participation for the program to accomplish desired results.

As significant difference exists in the level of respondents' awareness in SWM Practices in terms of size of the school, it is therefore recommended that for SWM Programs and Advocacies to be more effective, awareness on waste management issues as well as sustainable solutions to these problems should be sought for the integration of the school's educational mission and community's active participation regardless of the number of teacher and student population.

As significant difference exists in the extent of implementation of Solid Waste Management (SWM) Practices in terms of school location, it is further recommended that education as an important component of SWM should be further intensified to establish a good program in the community. In the same manner, regardless of the school location, it is the attitude that should be positively developed as deemed needed on SWM execution and implementation.

As significant relationship exists between the level of respondents' awareness and extent of implementation of Solid Waste Management (SWM) Practices, it is therefore recommended that like growing awareness, proper implementation should be given equal focus and attention. Therefore, awareness accompanied by participation served as a key for people to be involved in the waste management programs of the community for its effective and sustainable implementation.

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APPENDICES

**Survey Instrument on
Awareness and Implementation of Solid Waste Management (SWM) Practices**

Part I. Profile of the Respondents

Name(Optional) _____

Name of School: _____

Sex: Male Female Size of School: Smaller Bigger

School Location: _____

| <input type="checkbox"/> | Barangay | <input type="checkbox"/> | Schools |
|--------------------------|-----------|--------------------------|-----------------------------|
| <input type="checkbox"/> | Banga | <input type="checkbox"/> | Banga Central School |
| | | <input type="checkbox"/> | BCSTEC Elementary School |
| | | <input type="checkbox"/> | Buli-Buli Elementary School |
| | | <input type="checkbox"/> | Cansig-id Elementary School |
| <input type="checkbox"/> | Malabugas | <input type="checkbox"/> | Telesforo Gargantiel MES |
| <input type="checkbox"/> | Nangka | <input type="checkbox"/> | Dean Felix Gaudiel MES |
| <input type="checkbox"/> | Pagatban | <input type="checkbox"/> | H.Bido Jordan MES |

Part II. Questionnaire Proper

A. Level of Respondents' Awareness on Solid Waste Management (SWM) Practices

Instruction: Please check the number that corresponds to the level of your awareness in the following items. It is important that you honestly answer each item. Please do not leave any item unchecked. Rest assured that your individual information will be treated with strict confidentiality. Please refer to the guide below in choosing your option.

| Code | Interpretation |
|------|----------------|
| 5 | very high |
| 4 | high |
| 3 | moderate |
| 2 | low |
| 1 | very low |

| A. SWM Practice (Segregation) | 5 | 4 | 3 | 2 | 1 |
|--|----------|----------|----------|----------|----------|
| <i>What is your level of awareness on the following:</i> | | | | | |
| 1 Segregation of biodegradable (paper, banana peels, cardboard, food wastes, leaves, twigs and vegetables) and non-biodegradable (plastic toys, glass, steel, rubber) wastes at school. | | | | | |
| 2 Separation of recyclable wastes (paper, cardboard, plastic bottles) from non-recyclable or residuals which have no potential for reuse and recycling (sando bags, napkins, diapers, ball pens, etc.) | | | | | |
| 3 Separation of non-harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others. | | | | | |
| 4 Separation and segregation of garbage in different containers. | | | | | |
| 5 Segregation of recyclable items for collection. | | | | | |

| B. SWM Practice (Reduce) | 5 | 4 | 3 | 2 | 1 |
|--|----------|----------|----------|----------|----------|
| <i>What is your level of awareness on the following:</i> | | | | | |
| 1 Borrowing, sharing, and/or renting things that are needed occasionally. | | | | | |
| 2 Buying only what is needed so that one will not end up throwing away extra food. | | | | | |
| 3 Packing lunch in reusable lunchbox so that one cannot buy wrapped/packed food at school. | | | | | |
| 4 Bring water in reusable water bottles than buying water in one used plastic bottles at the school. | | | | | |
| 5 Being cautious and responsible to every waste one produce. | | | | | |

| C. SWM Practice (Reuse) | 5 | 4 | 3 | 2 | 1 |
|--|----------|----------|----------|----------|----------|
| <i>What is your level of awareness on the following:</i> | | | | | |
| 1 Reusing old materials than buying a new one. | | | | | |
| 2 Keeping those unfilled papers and using it as scr | | | | | |
| 3 Reusing grocery bags. | | | | | |
| 4 Reusing washable food containers. | | | | | |
| 5 Reusing scrap paper into memo pads. | | | | | |

| D. SWM Practice (Recycle) | 5 | 4 | 3 | 2 | 1 |
|---|----------|----------|----------|----------|----------|
| <i>What is your level of awareness on the following:</i> | | | | | |
| 1 Redesigning waste materials into a new product. | | | | | |
| 2 Making decors out of plastic wrappers and other colorful waste materials. | | | | | |
| 3 Promoting the importance of recycling. | | | | | |
| 4 Initiating income-generating activities out of waste materials. | | | | | |
| 5 Using recycled products out of redesigned waste materials. | | | | | |

| E. SWM Practice (Disposal) | 5 | 4 | 3 | 2 | 1 |
|---|----------|----------|----------|----------|----------|
| <i>What is your level of awareness on the following:</i> | | | | | |
| 1 Throwing and leaving of garbage anywhere. | | | | | |
| 2 Burning of waste materials. | | | | | |
| 3 Throwing of waste materials in common open dumps. | | | | | |
| 4 Disposal of biodegradable wastes into a compost pit. | | | | | |
| 5 Disposal of hazardous/ toxic/special wastes such as laboratory leftover (chemicals) or electronic waste in any garbage container. | | | | | |

B. Extent of Implementation of Solid Waste Management Practices

| Code | Interpretation |
|------|----------------|
| 5 | always |
| 4 | often |
| 3 | sometimes |
| 2 | rarely |
| 1 | almost never |

| SWM Practice (Segregation) | 5 | 4 | 3 | 2 | 1 |
|---|----------|----------|----------|----------|----------|
| <i>To what extent is your implementation of the following:</i> | | | | | |
| Segregation practice is evident in classrooms, offices and canteen. | | | | | |
| Waste is segregated into at least two types. | | | | | |
| Receptacle for special waste is necessary wherever applicable. | | | | | |
| No unmanaged waste receptacles outside the classrooms. | | | | | |
| MRF is available. | | | | | |
| b. SWM Practice (Reduce) | 5 | 4 | 3 | 2 | 1 |
| <i>To what extent is your implementation of the following:</i> | | | | | |
| 1 Avoidance of use of plastics in canteen. | | | | | |
| 2 No more plastics used as secondary packaging material. | | | | | |
| 3 Most foods are packed using biodegradable materials. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1 Orient school canteen vendors on plastic avoidance policy. | | | | | |
| 2 Implement DepEd-Bayawan City’s policy on plastic avoidance in canteens. | | | | | |
| SWM Practice (Reuse) | 5 | 4 | 3 | 2 | 1 |
| <i>To what extent is your implementation of the following:</i> | | | | | |
| 1 Composting of biodegradable waste. | | | | | |
| 2 Actual application of compost in gardening. | | | | | |
| 3 Reuse used tires as decorative flower pots. | | | | | |
| 4 Use of compost products or soil from the compost pit were used in the garden. | | | | | |
| 5 Re-use practices are evident. | | | | | |
| d. SWM Practice (Recycle) | 5 | 4 | 3 | 2 | 1 |
| <i>To what extent is your implementation of the following:</i> | | | | | |
| 1 Recover and recycle papers (pots, charcoal, etc). | | | | | |
| 2 Plastic waste turned into pillows as one of the examples. | | | | | |
| 3 Drinking straws and popsicle sticks made into tiny houses among others. | | | | | |
| 4 Products out of recyclable materials show promise (profit, utility, etc). | | | | | |
| 5 MRF is available. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| e. SWM Practice (Disposal) | 5 | 4 | 3 | 2 | 1 |
| <i>To what extent is your implementation of the following:</i> | | | | | |
| 1 Proper disposal of special wastes. | | | | | |
| 2 On site establishment of composting facilities for biodegradable wastes (any of these: compost pit, vermicompost, etc.) | | | | | |
| 3 Proper observance of collection schedules for specific category of segregated solid wastes. | | | | | |
| 4 Designate drop-off center/MRF (ideal, sturdy, labeled, actual sales on recyclable waste). | | | | | |
| 5 Residual waste due for collection is inside sacks to facilitate collection by the LGU. | | | | | |

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