Environmental Awareness and Sustainable Development Practices of Senior High School Students

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Abstract— **Exhausting all the available scientific and technological means to use our natural resources for our conveniences could drastically affect our nature. This study aimed to determine the extent of environmental awareness and the level of sustainable development practices of Senior High School students in President Diosdado Macapagal Memorial National High School. Results showed that the respondents' extent of environmental awareness in terms of waste management, pollution, and climate change was high while their level of sustainable practices as to proper waste disposal, energy conservation, and tree-planting activities was also high. Findings revealed also that there was a significant relationship between climate change and tree planting activities, climate change and proper waste disposal, waste management and proper waste disposal, pollution and tree planting activities, and pollution and energy conservation. On the other hand, no significant relationship was found out between climate change and energy conservation, waste management and tree planting activities, waste management and energy conservation, and pollution and proper waste disposal. Thus, the use of the crafted intervention framework based on the findings of the study is recommended for the SHS students to become responsible eco-warriors for a greener and progressive environment.**

Keywords— *Environmental Awareness, Intervention Framework, and Sustainable Development Practices*

I. INTRODUCTION

Concerns on the state of degradation of the global environment have grown with increasing resonance over the past decade. Global warming, deforestation, water, air and land pollution are major problem with short and long term impacts on the very survival of planet Earth and humans. Natural environment continues to be degraded thus the negative environmental feedbacks are being experienced in the world. These feedbacks include flood, soil erosion and climate change. As a response to this growing concern about human society's impact on the environment, the concept of sustainable development practices has emerged.

In this context, Pachamama Alliance (2018) considered environmental awareness as an easy way to understand the fragility of our environment and the importance of its protection and preservation while Ema (2005) defined sustainable development practices as one that meets the needs of the present without compromising the ability of future generations in satisfying their own. It shows that sustainable development focuses on human needs and life supporting systems which includes earth, ecosystems, natural resources, culture and community.

Thus, Ecological Solid Waste Management Act of 2000 provides the legal framework for the systematic, comprehensive and ecological solid waste management program of the Philippines, which shall ensure protection of public health and the environment. It emphasizes the need to create the necessary institutional mechanisms and incentives, and imposes penalties for acts in violation of any of its provision. It also aims to ensure the proper segregation, collection, transport, storage, treatment and disposal of solid waste through the formulation and adaption of the best environmental practice in ecological waste management excluding incineration.

With this, education is one of the main aspects to achieving sustainable development. This constitutes an important part in ensuring that human beings acquire knowledge, skills, attitudes, and values necessary to shape a sustainable future. To realize this, everyone needs to become aware of the need for such development and make appropriate changes to their own behavior Mwendwa (2017).

Furthermore, Kimaryo (2011) emphasized that education for sustainable development envisions a better world where there is a balance between economy, ecology and society. In practice, Ssozi (2012) pointed out that education for sustainable development should address holistically other academic disciplines apart from ecosystem and life science. Hence, formal school system must comply with the provisions of the Philippine Constitution, Presidential Decree and various Memoranda from Department of Education such as Presidential Decree 1152, Republic Act No. 9512, DepEd Order No. 52, s. 2011, DepEd Order No. 72, s. 2003 and DepEd Memorandum No. 133, s. 2014.

However, despite the serious efforts both the government and other concerned organizations, it is still a challenge to educators and to the school administrators as well to inculcate political, social, and moral responsibility of caring for the environment of the students to attain and sustain the benefits of engaging to sustainable development since humans undergo some changes which are based on multidisciplinary system of survival while others are becoming more innovative and are always attributed by upgrading and updating technology for more satisfactory living inputs. Such advancements push human to exhaust the environment with a little sense of being a steward.

In addition, SHS students of President Diosdado Macapagal Memorial National High School are required to plant a tree before graduation. Unfortunately, the school lacks personnel and means to monitor and to maintain/sustain the program. Likewise, although different Trash Bins are provided inside the classrooms and within the school premises with labels of biodegradable, non-biodegradable, and recyclable, students are still irresponsibly throwing or disposing their garbage inappropriately. Not all the Material Recovery Facilities (MRF) are functioning well. Environmental Trainings/Symposia are seldom conducted among students, too. Hence, willingness and initiative among the students in participating in the Clean Up Drive Activities and other forms of environmental activities are not that high unless plus factors are to be given to them. This strengthens the findings of Labog (2017) which revealed that only a little portion of the Earth's population are working to reverse or minimize the negative impact of false sustainability planted in the digital minds of the youth.

Therefore, as educators, teachers should have inculcated the love, awareness and care for the environment into the students' mind and these require cognitive, affective and psychomotor learning through integration of the concepts students learned. Apparently, the transformation needed for a cleaner, greener planet requires integrative, innovative and creative thinking, cultivated jointly by schools, governments, civil society organizations and companies. This collaboration calls for education that goes beyond the transfer of knowledge and desirable behaviors by focusing on multiple perspectives – economic, ecological, environmental and sociocultural – and by developing empowered, critical, mindful and competent citizens. Such education can contribute to the realization of new forms of citizenship, entrepreneurship and governance that center on the current and future well-being of people and the planet.

Based from the discussion, the researchers felt that these ecological crises are not just the task of policy-makers, scientists, and environmentalists to find solution but rather it involves everyone. Theories and applications are mostly learned at school that is why this study aims to explain the extent of environmental awareness and the level of sustainable development practices of SHS students in President Diosdado Macapagal Memorial National High School in the municipality of Gloria to gain more information and understanding which the researchers believe as supplement for deeper understanding of its readers. This academic undertaking provides the most reliable information on sustainable development practices and environmental education of the student-respondents.

II. METHODS

Descriptive-correlational method of research was utilized in this study. A two-part-self-made questionnaires which were prudently validated by the expert and employed for reliability testing was used as primary data gathering tool in gathering data to 191 Grade 12 SHS students who were randomly chosen from a total population of 364 in President Diosdado Macapagal Memorial National High School. Data were treated statistically using Descriptive Statistics such as Weighted Mean, Percentage, and Ranking and Inferential Statistics such as Pearson's r. Descriptive Statistics were used in describing the extent of the environmental awareness and the level of the sustainable development practices of the student-respondents. Meanwhile, to determine the significant relationship between the two variables, Pearson's r was employed.

III. RESULTS AND DISCUSSION

In the extent of Environmental Awareness in terms of Climate Change, the respondents perceived themselves to be at the high extent in terms of participation in information dissemination about climate change in the school and to the entire community is needed as spelled out in item number 5 with the highest mean score of 4.30 while the lowest mean score of 3.91 was obtained in item number 3 which shows that the respondents were also on the high extent in terms of spending the allocated time efficiently through provision of tangible examples and sharing of experiences connected to climate change. The overall mean score of 4.06 described as high extent stresses that the respondents are generally aware of the things that must be done relative to Climate change mitigation. This result is supported by the notion of Rufino et al. (2015) which explained that to cope effectively with the developments, the knowledge and awareness of climate change and its implication are very important.

Table 1.1 Mean Results on the Extent of Environmental Awareness of Senior High School Students in President Diosdado Macapagal Memorial National High School in terms of Climate Change

Items	Mean	Rank	Description
As a SHS student, I am aware that...			
1. positive outlook of on disaster risk reduction and management should be inculcated and be developed among us	4.20	3	High Extent
2. we have to keep abreast with latest environmental issues worldwide such as the impact of climate change both in living and non-living things	3.94	6	High Extent
3. allocated time should be spent efficiently through provision of tangible examples and sharing of experiences connected to climate change	3.91	8	High Extent
4. if we want to heighten our awareness, there is a need to be involved in information campaigns on climate change	4.23	2	High Extent
5. participation in information dissemination about climate change in the school and to the entire community is needed	4.30	1	High Extent
6. engage ourselves in the teacher-initiated activities about climate change for a keen observation	3.92	7	High Extent
7. inviting resource speakers can help us develop our knowledge and skills about climate change and disaster preparedness	4.04	4	High Extent
8. regular attendance in various forum and seminars on climate change is of great help in increasing my awareness	3.98	5	High Extent
Over-All Mean	4.06		High Extent

In terms of Waste Management, the respondents perceived that they were on the very high extent in considering researches in introducing and implementing new and innovative techniques in waste management as discussed in item number 7 with an obtained mean score of 4.62 which ranked the highest while the active engagement in LGU-led programs on waste management ranked the lowest with mean score of 4.09 described as high extent. Hence, the results revealed that the SHS students perceived their environmental awareness in terms of waste management was on the high extent as indicated by the obtained overall mean score of 4.44. These findings are found similar to the notion of Nierkerk (2014) which revealed that having more knowledge about waste management would have a positive impact to everyone.

Considering environmental awareness in terms of Pollution, the respondents admitted that they were on the very high extent in terms of considering the constant quest for factual data and information as to how the human beings are being affected by pollution as discussed in item number 1. This can be attested by the obtained mean score of 4.71 which ranked the highest while the lowest mean score of 4.13 described as high extent was obtained in item number 6 which states that involvement in various outreach programs which educate the community in decreasing the production of different kinds pollutants like not burning plastics is necessary. This led the respondents to obtained an over-all mean score of 4.31 described as high extent.

Table1.2 Mean results on the Level of Environmental Awareness of Senior High School in President Diosdado Macapagal Memorial National High School in terms of Waste Management

Items	Mean	Rank	Description
As a SHS student, I am aware that...			
1. there is a need for the enhancement and development of local waste management not only in school but more so at home	4.40	6	High Extent
2. our school should set unified standards for the segregation, management, and disposal of solid waste	4.54	3	Very High Extent
3. allotted time should be spent wisely through brainstorming to come up with concrete data and information on the essence of appropriate waste management practices in school, home, and to the community at large	4.39	7	High Extent
4. waste segregation can be done efficiently by putting containers for biodegradable, non-biodegradable waste, and toxic waste	4.47	4	High Extent
5. consistent monitoring and evaluation of waste management practices should be done to ensure the set standards are being strictly followed	4.57	2	Very High Extent
6. active engagement in LGU-led programs on waste management is a must	4.09	8	High Extent
7. researches should be considered in introducing and implementing new and innovative techniques in waste management	4.62	1	Very High Extent
8. whenever a symposium on waste management, seeking the help and assistance directly from the experts such as resource speakers from DENR, DA, and other related offices is indeed crucial	4.45	5	High Extent
Over-All Mean	4.44		High Extent

Table1.3 Mean results on the Extent of Environmental Awareness of Senior High School in President Diosdado Macapagal Memorial National High School in terms of Pollution

Item	Mean	Rank	Description
As a SHS student, I am aware that...			
1. a constant quest for factual data and information as to how the human beings are being affected by pollution	4.71	1	Very High Extent
2. we should play as role models to our fellow students by offsetting the negative impacts of pollution	4.21	6	High Extent
3. there is a need to explain where waste pollutants are generated in school	4.33	3	High Extent
4. we need to be provided with appropriate activities which will help us comprehend the ways and mean lessening if not totally eradicate pollution	4.35	2	High Extent
5. eco bags and other use eco-friendly products should be used instead of plastic	4.19	7	High Extent
6. involvement in various outreach programs which educate the community in decreasing the production different kinds pollutants like not burning plastics	4.13	8	High Extent
7. guidelines provided by the concerned agency should be strictly observed in order to minimize the emission of pollutants	4.25	5	High Extent
8. there is a need for a consistent monitoring and evaluation of pollution in the community	4.30	4	High Extent
Over-all Mean	4.31		High Extent

On the other hand, the level of sustainable development practice of the respondents in terms of tree-planting activities, the respondents rated that their school is on the high level in keeping the development of their values regarding the essence of trees in their environment. This can be confirmed by the obtained mean score of 4.38 which ranked the highest. The lowest mean score of 3.88 described as high level was obtained in item number 3 which states that their school is teaching them the importance of reforestation and urban greening. Hence, they obtained an over-all mean score of 4.06 described as high level. This is strengthened by the findings of Shaju (2017) which pointed out that pollution need to be

prevented or controlled to preserve environmental resources and to improve environmental quality.

Table 2.1 Mean results on the Level of Sustainable Development Practices of Senior High School in President Diosdado Macapagal Memorial National High School in terms of tree-planting activities

Items	Mean	Rank	Description
Our school is...			
1. keeping the development of our values regarding the essence of trees in our environment.	4.38	1	High Level
2. letting us to be involved in the DENR and DepEd recognized tree planting activities	4.01	4	High Level
3. teaching us the importance of reforestation and urban greening	3.88	8	High Level
4. planting trees in different flood prone areas	3.98	6	High Level
5. assigning a certain area to be used as nursery for endangered species of trees like Narra and the like	3.99	5	High Level
6. doing action researches about off and in-campus tree planting activity with the approval from the concerned authorities	4.09	3	High Level
7. participating in different greening programs in the city/municipality with support from both internal and external stakeholders	3.91	7	High Level
8. partaking in a well-defined reforestation with support and acknowledgment from the concerned agencies and internal and external stakeholders	4.23	2	High Level
Over-all Mean	4.06		High Level

In addition, the level of sustainable development practice of the respondents in terms of energy conservation, they admitted that they were on the high level in terms of opening the television only for important matters like watching current news as indicated by the obtained mean score of 4.25 in item number 6 while the lowest mean score of 3.85 described as high level was obtained by item number 4 which states that the respondents are not using cellphone while charging. Hence, they obtained on over-all mean score of 4.07 described as high level. This is congruent to the findings of Crosby (2013) which revealed that energy awareness among faculty, staff, and students, managing school building operations and upgrading mechanical equipment are complementary avenues which lead to energy savings in school.

Table 2.2 Mean results on the Level of Sustainable Development Practices of Senior High School in President Diosdado Macapagal Memorial National High School in terms of Energy Conservation.

Items	Mean	Rank	Description
We are ...			
1. Using LED lights	4.09	5	High Level
2. Opening the faucet in washing dishes if only needed	4.08	6	High Level
3. Unplugging the appliances that are not in used.	4.18	2	High Level
4. Not using my cell phone while charging.	3.85	8	High Level
5. Not using the extension octopus wire	3.86	7	High Level
6. Opening the television to be updated about current news	4.25	1	High Level
7. Not leaving my room when the electric fan is on	4.10	4	High Level
8. Turning off the main switch in our house if our family were leaving.	4.15	3	High Level
Over-all Mean	4.07		High Level

Similarly, in terms of proper waste disposal, the respondents rated themselves to be at the high level because their school is tapping with LGUs for correct collection and disposal of waste as discussed in item number 8 with a mean score of 4.35. The lowest mean score of 4.08 described as high level was obtained in item number 6 which state that the school-respondent is forming forum and conferences for them to know how can they effectively practice waste segregation through the provisions of separate trash bins for biodegradable and non-biodegradable waste. This led them to obtained an over-all performance of 4.23 described as high level in proper waste disposal. This is found similar to the notions of Rioux and Zaman (2018) which argued that improper waste disposal may severely endanger public health and environment. Hence, handling hazardous waste must be regulated from the moment of generation until its disposal at its final destination.

Table 2.3 Mean results on the Level of Sustainable Development Practices of Senior High School in President Diosdado Macapagal Memorial National High School in terms of proper waste disposal

Items	Mean	Rank	Description
Our school is...			
1. allotting a certain area for trash bins and pits inside the school premises	4.31	2	High Level
2. crafting policy guidelines and standards on proper solid waste management	4.20	5	High Level
3. integrating in classroom activities some best practices on SWM of the neighbouring secondary schools in the province and in the country as well	4.19	6	High Level
4. assessing and monitoring regularly the disposal of stored wastes in order to avoid the spread of foul odor	4.18	7	High Level
5. separating consistently biodegradable, non-biodegradable, and hazardous wastes from chemicals inside the different school laboratories	4.28	3	High Level
6. forming forum and conferences for us to know how can we effectively practice waste segregation through the provisions of separate trash bins for biodegradable and non-biodegradable waste	4.08	8	High Level
7. giving technical and financial support for maintenance and continuous proper waste disposal inside the school premises	4.21	4	High Level
8. tapping with LGUs for correct collection and disposal of waste	4.35	1	High Level
Over-all Mean	4.23		High Level

Table 3. Correlation Results on the Significant Relationship between the Extent of Environmental Awareness and Level of Sustainable Development Practices of Senior High School Students in President Diosdado Macapagal Memorial National High School

Extent of Environmental Awareness of Senior High School Students	Level of Sustainable Development Practices of Senior High School Students								
	Tree Planting Activities			Energy Conservation			Proper Waste Disposal		
	r-value	r^2	Result	r-value	r^2	Result	r-value	r^2	Result
Climate Change	0.18	0.03	S	-0.86	0.074	NS	0.13	0.02	S
Waste Management	-0.010	0.0001	NS	-0.058	0.003	NS	0.52	0.27	S
Pollution	0.85	0.72	S	0.32	0.10	S	-0.07	0.0005	NS

Critical r-value : 0.087
Degrees of Freedom : 189
Level of Significance : 0.05

Meanwhile, results also revealed also that there was a significant relationship between climate change and tree planting activities, climate change and proper waste disposal, waste management and proper waste disposal, pollution and tree planting activities, and pollution and energy conservation as shown by the obtained computed values of 0.18, 0.02, 0.27, 0.85, and 0.32 respectively which all exceeded the given critical r-value of 0.087 using 189 degrees of freedom at 0.05 level of significance. Hence, the null hypotheses for these items were rejected. On the other hand, no significant relationship was found out between climate change and energy conservation, waste management and tree planting activities, waste management and energy conservation, and pollution and proper waste disposal. This was attested by the obtained computed r-values of -0.074, -0.010, -0.034, -0.04 respectively which all failed to exceed the given critical r-value using 189 degrees of freedom at 0.05 level of significance. Thus, the hypotheses for these items were accepted.

IV. CONCLUSION AND RECOMMENDATIONS

The environmental awareness of the SHS students in President Diosdado Macapagal Memorial National High School is terms of climate change, waste management, and pollution is high. In addition, the level of sustainable development practices of the student-respondents in terms of tree-planting activities, energy conservation, and proper waste disposal is high. Furthermore, the environmental awareness of the respondents in terms of pollution affect their tree-planting activities and energy conservation practices.

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