Characterizing the Environmental Knowledge and Attitude of 8th Grade Students

Lowe Ana Marie L. Trance¹, Naci John C. Trance²
¹²Iloilo Science and Technology University, Iloilo City, Philippines
¹lam_ligad@gmail.com, ²nacijohn@gmail.com

Abstract. The knowledge and attitude of people towards the environment are reflective of society’s ecological health. Thus, in many countries around the world, the curriculum for science education has already embraced the concept of environmental education. Subsequently, the internet offers a lot of materials about the protection and conservation of the environment, but only a few are contextually appropriate for teachers’ and students’ consumption. This study embarks on characterizing the learners before creating learning materials suitable to them. The study acknowledges the influence of such learning materials in raising an individual’s accountability towards the environment. Specifically, the study probed the knowledge and attitude of students regarding waste management. The researchers find it essential to comprehend the nature of the learners in making them responsible for their environment.

1. Introduction

The level of global environmental issues is becoming severe and beyond disputes [1]. International organizations and fora have initiated movements addressing environmental challenges, giving birth to the concept of environmental education (EE) [2] and environmental citizenship [3]. Consequently, the importance of EE turns out to be globally recognized and emphasized as an effective way of dealing with the multifaceted problems of the environment [4]. Thus, the call for EE is a call for local, regional, and global actions in response to the worldwide trend of environmental degradation [5], [6].

In the Philippines, the Department of Education, Culture, and Sports (DECS, now DepEd) started in 1977 the integration of EE subjects in school curricula at all levels. Since then, a lot of capacity building efforts were established and formulated. One of these efforts was the drafting of the Philippine Strategy for Sustainable Development in 1988 where EE is one of the 10-pronged strategies. Another attempt was the formulation of the updated National Environmental Action Plan for Sustainable Development for 2005-2014 in support of the United Nations Decade for Sustainable Development.
The Philippine Congress enacted the Enhanced Basic Education Act in 2013 to strengthen the curriculum and increase the number of years for basic education. For most people, this is known as the K-12 curriculum. Curriculum framers working with the K-12 program stressed that they had incorporated EE in the new curriculum. Researchers [7], [8] confirmed this claim through surveys and interviews. They further affirmed that the implementation of EE in rural schools was not significantly different from that in urban schools, an indication of the similarities of teaching curriculum in EE as embedded in the K-12 curriculum.

The implementation of the K-12 curriculum is not new to other countries around the world, which suggests that many learning materials are freely available to use. However, the Philippines has newly implemented the curriculum and that few articles were contextually ready for utilization of both teachers and students. The study embarks on characterizing the learners before creating learning materials appropriate to them. Specifically, the study sought to determine the least learned knowledge and linked it with the exhibited attitude. The researchers believed that the output of this study serves not only as an initial but essential step in the preservation and protection of the environment.

2. Literature Review

2.1 The campaign for EE

The Agenda 21 of the United Nations Conference on Environment and Development in 1992 reiterated that school children are obliged to participate actively in securing the quality of the environment [9]. However, for students to meaningfully participate in the campaign, the knowledge, skills, and attitude towards the environment are required and can be gained through EE. It is therefore recommended to integrate the primary goals and objectives of EE in school curricula so that personal thoughts, feeling, and environmental actions will develop in the students [10].

Indeed, many countries integrated environmental education (EE) in their curricula [3]. Conversely, [11] realized that the movement which was conservation education was oriented to necessary resources, but not to the community environment and its associated problems. For developing countries, the campaign of EE lies on the issue of “education for relevancy” [12]. This issue is a political reality wherein parents and children viewed formal education as a way out of poverty. Children who graduated their degrees tend to migrate to the cities to try their luck; leaving their communities crying for help on problems relating to development. In this way, the school’s role of certification is directly against rural development. This puzzle gives rise to the question of linking schooling with community development and environment concerns.

EE bring forth several laws and department orders. In the Philippines, the National Environment Awareness and Education Act of 2008 ordered the DepEd, Commission on Higher Education, Technical Education and Skills Development Authority, and the Department of Social Welfare and Development. The stated agencies shall coordinate with the Department of Environment and Natural Resources, Department of Science and Technology and other relevant agencies to integrate EE in its school curricula at all levels, whether public or private, including in barangay daycare, preschool, non-formal, technical vocational, professional level, indigenous learning and out-of-school youth courses or programs.

2.2 Environmental knowledge and attitude

A literature review by [13] has enumerated several nation-wide collections of students’ knowledge and attitude towards environmental issues and uncovered the extent of environmental knowledge (EK) and commitment among students. For them, “it is fundamental to know how much the students already know, how they feel and what they are doing regarding environmental matters.” Also, high school students with higher knowledge scores exhibited more favorable environmental attitudes (EA) than students with lower
knowledge scores [14]. Besides, while students at the university possess higher levels of EK than the public, the overall average of students’ EK is a deficit [15]. Likewise, the overall knowledge level among student-respondents regarding environmental problems can be considered low [3]. Furthermore, [16] found out that preservice teachers acquired positive attitudes for the environment and environmental problems towards the end of high school and significant changes. Similarly, they pointed out that the level of students’ EK increases as their grade level went up because the accumulation of EK is parallel to their grade level.

3. Methodology

The study used a quantitative research design. The researchers considered the 8th-Grade level of the K-12 curriculum because of topics on environmental protection and preservation, so as the 8th-Grade students of the school year 2017-2018 as the respondents. Contextually, EK refers to the totality of the experiences gained together with the basic understanding of the environment and its problems [17]. It also applies to knowledge a person has regarding environmental issues [18]. Likewise, EA is “a person’s concept of self and the degree to which an individual perceives himself or herself to be an integral part of the natural environment” [19], [20].

The researchers used a validated and piloted survey questionnaire on waste management to gather data. The questionnaire has four parts, namely: Socio-Demographics, Preliminaries, EK, and EA. The EK part has thirty (30) multiple choice items while the EA part consists of twenty-two (22) Likert scale items. The researchers acquired other required permissions from teachers, principals or head before administering the questionnaire. The researchers employed statistical measures such as frequency count, percentages, and ranking to determine the least learned knowledge and manifested attitude. Likewise, The researchers used a Statistical Package for Social Sciences (SPSS) software version 15 in assessing the reliability of the questionnaire. The researchers also conducted classroom observations to verify the attitudes claimed by students.

4. Results and Discussions

Ninety-seven (97) of the one hundred fourteen (114) Grade 8 students responded to the survey. The respondents were bona fide students of four junior high schools in Iloilo City. Two of these schools are laboratory schools, and the other two are public high schools. Of the respondents, forty-four (44, 45.4%) are male and fifty-three (53, 54.6%) are female. Seventeen (17) of the invited students did not answer the survey because of some personal and other relevant reasons. Table 1 showed the characteristics of the respondents. Consequently, the questionnaire has a reliability of 0.728 and 0.861 for EK and EA, respectively. Table 2 shows the SPSS results for the reliability statistics of the two parts of the questionnaire.

| Junior High School | Male | Female | Did not join | Total |
|--------------------|------|--------|--------------|-------|
| School A           | 13   | 16     | 5            | 34    |
| School B           | 8    | 14     | 2            | 24    |
| School C           | 14   | 13     | 6            | 33    |
| School D           | 9    | 10     | 4            | 23    |
| Total              | 44 (45.4%) | 53 (54.6%) | 17 | 114    |

| Environmental knowledge | Environmental attitude |
|-------------------------|-----------------------|
| Table 2. Reliability statistics of the questionnaire |
Cronbach’s Alpha Based on Standardized Items

| Topics       | Cronbach’s Alpha | N of Items |
|--------------|------------------|------------|
| 3R’s         | .730             | 30         |
| Laws         | .728             |            |
| Waste Disposal | .861         | 22         |
| Recycling    | .857             |            |

Tables 3 and 4 revealed the environmental knowledge and attitude, respectively, of Grade 8 students regarding waste management. Of the respondents, about sixty percent (59.80%) know how to classify waste materials. Less than fifty percent (47.42%) of them can identify the appropriate method for disposing of a particular waste. Besides, about thirty-five percent (35.88%) of them comprehended 3Rs. Furthermore, below twenty percent (17.01%) of them understand recycling and only about ten percent (9.73%) of them were aware of the existing laws and orders. These results denote that most of the respondents have better discernment in classifying waste compared with other topics. Items relating to environmental regulations (1st) and recycling (2nd) were the least mastered topics. On the other hand, the respondents exhibit very positive attitudes toward 3Rs (4.32, 1st), adhering to the norm of the society (4.30, 2nd), and recycling (4.29, 3rd). Besides, they showed positive attitudes toward waste disposal (4.20, 4th) and displayed a sense of responsibility (4.09, 5th).

**Table 3. Respondents’ environmental knowledge (waste management)**

| Topics       | no. of students with the correct answer (%) | Rank |
|--------------|--------------------------------------------|------|
| 3R’s         | 35.88                                      | 3    |
| Laws         | 9.73                                       | 1    |
| Waste Disposal | 47.42                                   | 4    |
| Recycling    | 17.01                                      | 2    |
| Classifying waste | 59.80                                  | 5    |

**Table 4. Respondents’ environmental attitude (waste management)**

| Topics                                     | Mean Score (Interpretation)       | Rank |
|--------------------------------------------|-----------------------------------|------|
| 3R’s                                       | 4.32 (very positive)              | 1    |
| Adhering to the norm of the society        | 4.30 (very positive)              | 2    |
| Waste Disposal                             | 4.20 (positive)                   | 4    |
| Recycling                                  | 4.29 (very positive)              | 3    |
| Sense of Responsibility                    | 4.09 (positive)                   | 5    |

With the results shown in Tables 3 and 4, the researchers assert the following:

1. Students want to perform 3Rs but do not know how.
2. Students think they are adhering to government laws but were not aware of the existing regulations and guidelines.
3. Students desire to recycle but do not know how to figure it out.
4. Most students attitude’ of waste disposal complement their knowledge, even with little or lack of background information or awareness.
5. Students do not know their responsibilities toward their environment.

Classroom observations validated these beliefs. Most students wanted to work in a cleaner room or environment. For instance, while cleaning the room, they did not correctly dispose of the waste using the appropriate bins. A study by [21] also supports these claims and stated that “many students and teachers lack sufficient EK but demonstrate positive attitudes towards the environment.” Oppositely, some students
with a higher level of EK did not develop the necessary EA and ignored the left-over waste materials in their classrooms. This observation is supported by [22], as he expressed that some students were not taking responsibility for addressing environmental problems. They were pre-occupied with their lessons and did not act on cleaning their surroundings. In most cases, some students will only pick litter during the supervision of a teacher or other person in authority.

5. Conclusion and Recommendations

The research findings showed that the 8th Grade students lack sufficient EK and EA regarding waste management. Nevertheless, they were demonstrating positive attitudes in dealing with waste even with limited knowledge. This observation is evidence that students prefer not only the development of their community but also the conservation and preservation of their environment. This study advocates that EE should be highlighted and given more emphasis inside and outside the classroom. The new curriculum shall integrate more environmental courses, aside from the existing ones. Student participation in environmental activities like tree planting and clean-up drives is also encouraged, which eventually help them develop their EK and EA. Consequently, the research findings are significant and considerable in the preparation of contextually appropriate learning materials to be integrated into the curriculum.

6. References

[1] Uzzell, D. L. (2000). The psycho-spatial dimension of global environmental problems. *Journal of environmental psychology*, 20(4), 307-318.
[2] Crompton, T., & Kasser, T. (2009). *Meeting environmental challenges: The role of human identity* (pp. 1-93). Godalming, UK: WWF-UK.
[3] Meerah, T. S. M., Halim, L., & Nadeson, T. (2010). Environmental citizenship: What level of knowledge, attitude, skill and participation the students own?. *Procedia-Social and Behavioral Sciences*, 2(2), 5715-5719.
[4] García-Mira, R., Real, J. E., & Romay, J. (2005). Temporal and spatial dimensions in the perception of environmental problems: An investigation of the concept of environmental hyperopia. *International Journal of Psychology*, 40(1), 5-10.
[5] Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, 20(4), 550-557.
[6] Pinar, W. F. (2003). Thinking globally in environmental education: Implications for internationalizing curriculum inquiry. In *International handbook of curriculum research* (pp. 61-80). Routledge.
[7] Lee, J. C. K., & Efird, R. (2014). Introduction: Schooling and education for sustainable development (ESD) across the Pacific. In *Schooling for sustainable development across the Pacific* (pp. 3-36). Springer, Dordrecht.
[8] Labog, R. A. (2017). Teachers’ Integration of Environmental Awareness and Sustainable Development Practices. *Asia Pacific Journal of Multidisciplinary Research*, 5(3).
[9] Meerah, T. S. M., Halim, L., & Nadeson, T. (2010). Environmental citizenship: What level of knowledge, attitude, skill and participation the students own?. *Procedia-Social and Behavioral Sciences*, 2(2), 5715-5719.
[10] Selim, M. S., & El Raey, M. (1999). Environmental education and training in Egypt: in the light of Agenta 21, Chapter 36. *La educación y la formación para el medio ambiente en Egipto: a la luz del Capítulo, 36*.
[11] Stapp, W. B. (1969). The concept of environmental education. *Environmental Education*, 1(1), 30-31.
[12] Singh, S. (2013). Four Pillars of Management Education. *Purushartha: A Journal of Management Ethics and Spirituality*, 6(1).
[13] Ivy, T. G. C., Road, K. S., Lee, C. K. E., & Chuan, G. K. (1998). A survey of environmental knowledge, attitudes and behaviour of students in Singapore. *International Research in Geographical and Environmental Education, 7*(3), 181-202.

[14] Bradley, J. C., Waliczek, T. M., & Zajicek, J. M. (1999). Relationship between environmental knowledge and environmental attitude of high school students. *The Journal of Environmental Education, 30*(3), 17-21.

[15] Kaplowitz, M. D., & Levine, R. (2005). How environmental knowledge measures up at a big ten university. *Environmental Education Research, 11*(2), 143-160.

[16] Sadik, F., & Sari, M. (2010). Student teachers' attitudes towards environmental problems and their level of environmental knowledge. *Cukurova University Faculty of Education Journal, 39*.

[17] Gillett, M. (1977). The Tbilisi Declaration. *McGill Journal of Education/Revue des sciences de l'éducation de McGill, 12*(002).

[18] Chan, R. Y., & Lau, L. B. (2000). Antecedents of green purchases: a survey in China. *Journal of Consumer Marketing, 17*(4), 338-357.

[19] Schultz, P. & Zeleny, L. (2000). Promoting environmentalism, *The Journal of Social Issues, 56*, 443-457.

[20] Blackwell, R. D., Miniard, P. W., & Engel, J. F. (2006). Consumer behavior Thomson Learning. Published by European Centre for Research Training and Development UK (www.eajournals.org).

[21] Esa, N. (2010). Environmental knowledge, attitude and practices of student teachers. *International Research in Geographical and Environmental Education, 19*(1), 39-50.

[22] Kasarani, O. (2014). Environmental awareness, attitude and participation among secondary school students: A comparative study (Doctoral Dissertation, Kenyatta University).