

Awareness and Understanding of the Environmental Principles and Concepts among Pre-Service Teachers in a Philippine University

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Abstract

The study involves eighty-seven (87) preservice teachers with specializations in biological sciences and physical sciences in Leyte Normal University. They were the respondents of this study because it aims to provide pre-service teachers the competencies, they need to perform the roles of a professional teacher. The focus of this study is on the assessment of the respondents' awareness and understanding of the different environmental principles and concepts. The research method used in this study is descriptive-evaluative. The instrument used was from Part IIB and Part III of the Assessment Tools for Project 4: Mainstreaming of Environmental Education in Teacher Education Curriculum. This is one of the projects in the Establishment of the BU-DENR Environmental Education Learning Resource Center for the National Network of Normal Schools (3NS). The results of the study showed that the awareness and understanding of the pre-service teachers on the environmental principles were good. Also, the findings revealed that the level of the students' understanding of the different environmental concepts was moderately high.

Keywords: Awareness; Environmental principles; pre-service teachers.

1. Introduction

The earth is now suffering from innumerable afflictions caused by egregious human activities that relentlessly denuding the environment. To take the wheel of action and move towards a common cause in preserving live on earth is the challenge for everybody [11].

Received: 5/25/2023

Accepted: 6/29/2023

Published: 7/11/2023

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One of the laws in the Philippines related to environmental and natural resources is RA 9512 otherwise known as the National Awareness and Education Act of 2008. This law supports the state “to promote national awareness on the role of natural resources in economic growth and the importance of environmental conservation and ecological balance towards sustained national development” [16]. In particular, this law orders, as well as, supports collaboration between the Department of Environment and Natural Resources (DENR) and academic institutions.

Academic institutions, therefore, inhere the legal and moral responsibility to help in strengthening the environmental education in the country considering the realities in their respective contexts, and their capabilities and resources as institutions [2].

Education is a way to provide people with information. Specifically, environmental education includes developing personal awareness of the environment and one’s connection to it; developing an understanding of environmental concepts and knowledge and the capacity to act responsibly upon what a person feels and knows, to implement the best solutions to environmental problems [15].

Through education, the teachers can bestow environmental protection. They enhance the skills and propensity necessary to appreciate ecological issues and take essential actions. Furthermore, teachers help their students develop an awareness of creative, dynamic, effective, and efficient environmental protection and management responsibilities [4]. In environmental sphere, the recognized powerful tool is people’s awareness. Information through education has an important impact to alter behavior [6].

One of the basic components of the education system is environmental education that enable students understand the importance of a healthy nature and a cleaner environment. The goals of environmental education are to transfer knowledge to safeguard the environment. Today, our lands are becoming unproductive, our water toxic, and our air polluted. The guiding principles of environmental education is to take a more critical role in making people aware of what we should do in the face of grave environmental concerns and alleviate the adverse effects of environmental degradation [4].

The Education for Sustainable Development of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) reiterates that education is an indispensable tool towards sustainable development. Environmental education is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems and which has the knowledge, attitudes, commitments and skills to work individually and collectively towards the solution of current problems and prevention of new ones [10]. Foreign studies were conducted to determine the environmental awareness and practices of students in various levels. The study of [14, 12] focused mainly on the environmental awareness and practices of college students, tertiary students’ environmental awareness in relation to their stream of study and their area of residence [13] college students’ level of awareness, attitude and participation in environmental activities [3], intrinsic and extrinsic motivation of tertiary students and their ecological awareness and practice [8], the level of environmental awareness and practices on recycling of solid waste of college students [9] and the high school students’ environmental risk perceptions and environmental awareness levels [1].

In the Philippines, studies focused on the environmental awareness and practices of high school students as basis for disaster preparedness program [7], level of awareness and extent of practices in green technology of college students [6], and the environmental awareness of the graduating college students [5].

The above-mentioned studies were focused in describing the extent of environmental awareness and practices of the students, whereas, this study was conducted in order to assess the awareness and understanding of the environmental principles and concepts of pre-service teachers.

2. Methods

This study used the descriptive-evaluative method of research to assess the awareness and understanding of the environmental principles and concepts of pre-service teachers.

2.1 Research Respondents

The research respondents of this study were the eighty-seven (87) pre-service teachers with specializations in biological sciences and physical sciences during the SY 2016 – 2017. They were the respondents of this study because it aims to provide pre-service teachers the competencies, they need to perform the roles of a professional teacher.

2.2 Research Instrument

The research instrument used was adapted from Part II.B (Please see Appendix A – with minimal modification) and Part III (Appendix B) of the Assessment Tools for Project 4: Mainstreaming of Environmental Education in Teacher Education Curriculum. This is one of the projects on the Establishment of the BU-DENR Environmental Education Learning Resource Center for the National Network of Normal Schools. The study conducted a survey to the preservice teachers of this university. The survey questionnaire consisted of two parts. First part included fifteen (15) statements related to the seven (7) environmental principles (Table 1) and classified by the respondent using the specific code. The second part contains fifteen – item test related to environmental education in biological science. Each item has four (4) options (a – d). The raw scores were transmuted to its equivalent percent rating and the interpretation was based from the university’s grading system.

Table 1a: Transmuted Raw Score to its Equivalent Percent Rating.

Raw Score	% Rating	Raw Score	% Rating
1	6.6	9	60
2	13.3	10	67
3	20.0	11	73
4	26.7	12	80
5	33.3	13	87
6	40.0	14	93
7	46.7	15	100
8	53.3		

Table 1b: Interpretation of the Raw Score to its Equivalent Percent Rating.

Raw Score	% Rating	Interpretation
15	100	(98 – 100) Excellent
13 – 14	86 – 94	(83 – 97) Very Good
8 – 12	53 – 80	(53 – 82) Good
6 – 7	38 – 47	(38 – 52) Fair
5 – 0	37 and below	(37 & below) Failed

3. Results and Discussion

In Part II.B of the survey questionnaire, the calculation of the frequency of the raw score and the equivalent percent rating of the eighty-seven (87) preservice teachers is shown in Table 2.

Table 2: Awareness and Understanding of the Environmental Principles.

Score	% Rating	No. of Students (N=87)	% Rating
5	33	2	Failed
6	40	1	Fair
7	47	6	Fair
8	53	10	Good
9	60	16	Good
10	67	22	Good
11	73	12	Good
12	80	11	Good
13	87	5	Very Good
14	93	1	Very Good
15	100	1	Excellent

From Table 2, it shows that out of 87 preservice teachers, only 1 got a perfect score and there were 2 who failed and obtained the lowest score of five (5). There were seventy-one (71) or 81.6% of the respondents got a score ranging from 8 – 12. This means that their awareness and understanding of the environmental principles is good.

The raw score, % rating and interpretation of the knowledge in environmental education in biological science among preservice teachers is in Table 3.

Table 3: Environmental Education in Biological Science.

Score	% Rating	No. of Students (N=87)	% Rating
7	47	8	Fair
8	53	15	Good
9	60	34	Good
10	67	17	Good
11	73	8	Good
12	80	4	Good
13	87	1	Very Good

From the result shown in Table 3, only one got the highest score of 13 and eight got the lowest score of 7. Nobody got a perfect score. Out of 87 preservice teachers, there were 78 or 89.7% got a score ranging from 8 – 12. This means that their knowledge in environmental education in biological science is good.

4. Conclusion

From the findings of the study, it shows that the awareness and understanding of the environmental principles among the eighty-seven (87) preservice teachers is good. Furthermore, they have also good knowledge in environmental education in biological science.

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Appendix A

Part II. Checklist on Awareness and Understanding of the Environmental Principles.

Read the statements below and indicate the environmental principle referred to by using the following codes:

- 1 – Environmental Principle 1 - Nature knows best.
- 2 – Environmental Principle 2 - All forms of life are important.
- 3 – Environmental Principle 3 - Everything is connected to everything else.
- 4 – Environmental Principle 4 -Everything changes.
- 5 – Environmental Principle 5- Everything must go somewhere.
- 6 – Environmental Principle 6- Ours is a finite earth.
- 7 – Environmental Principle 7- Nature is beautiful and we are stewards of God's creations.

Table 4

Statements	Classify the Environmental Principle
1. Living organisms and the environment change with the seasons.	
2. Although renewable resources can be replenished, the rate of consumption or exploitation should be balanced to the rate of replenishment.	
3. Human as beings gifted with reason and free will have dominion over all creatures and are capable of using these creations responsibly to their advantage.	
4. Organisms are linked to another through a feeding series, to the environment and the environment is also affected by the organisms living in it including the humans through their actions and practices.	
5. Population growth, polluting technologies and consumerist's lifestyle contribute to the depletion of the earth's limited resources.	
6. Wastes which are thrown away and disappear from sight does not cease to exist, they dispersed in the atmosphere or remain in the ecosystem in another form whether in useful or hazardous form.	
7. Chemicals like pesticides induce insect mutations which goes against the natural checks and balances.	
8. Practices such as the use of chemical pesticides, use of crude oil and burning of wastes go against the natural processes and lead to ecological backlash	
9. Nature has its own mechanism to maintain balance such as in the conduciveness of environment for growth and reproduction and feeding relationship between and among organisms.	
10. Both big and small creatures have invaluable roles in the ecosystem, and therefore to human life.	
11. Unlovely, wriggly and troublesome creatures such as earthworms, snakes, spiders and others are necessary part of nature.	

12. All faiths, whether religious or tribal beliefs, teach that everyone should respect all life and the order of nature and reject those that degrade the environment and human condition.	
13. Deforestation in the mountains may adversely affect the lowlands through erosions, floods and drought because all components of the ecosystem are linked to each other.	
14. Classification of wastes facilitates their proper disposal and minimizes the entry of toxic substances in the ecosystem, but does not eliminate wastes from the ecosystem.	
15. Humans cannot live without nature so they should not destroy or ravage it, but rather take care of it.	

Appendix B

Part III. Environmental Education in Biological Science

Read each item carefully and encircle the letter of the best answer. This part intends to determine what you already know about environmental concepts and principles, and the results will not in any way affect your academic standing.

1. The law on solid waste management requires the following except _____.
 - a. Recyclable materials must be recovered
 - b. Solid waste must be reduced at source which is the barangay
 - c. Local Government Units are responsible for enforcing the law
 - d. Solid waste management begins at home

2. Which of the following practices can help protect and preserve the environment and at the same time reduce the risk of occurrence of disasters such as floods and erosions?
 - a. Using of plastic and other non-degradable materials
 - b. Throwing of non-biodegradable material to bodies of water
 - c. Planting of trees and mangroves

- d. All of the above
3. Warming in the stratosphere is mainly caused by _____.
- a. absorption of ultraviolet radiation by ozone
 - b. release of latent heat energy during condensation
 - c. chemical reactions between ozone and chlorofluorocarbons
 - d. frictional heating caused by meteorites
4. Which of the following best describes the Earth's present status?
- a. The flooding, thunderstorms and hurricanes have increased over the past 100 years.
 - b. The amount of water vapor retained in the atmosphere has increased.
 - c. Outpouring of greenhouse gases since the industrial revolution is causing the planet to retain more heat.
 - d. All of the above
5. Which of these is NOT an expected effect of climate change
- a. sea level rising
 - b. flooding in coastal cities
 - c. expanding glaciers
 - d. extreme weather
6. The following are things that you can do to help reduce air pollution and clean the air except _____.
- a. Keep vehicle engine properly maintained.
 - b. Use bike or walk whenever possible.
 - c. Use private transportation.
 - d. Report smoke belching vehicles.
7. Which of the following is not an air pollutant?

- a. pollen from plants
- b. hydrocarbons
- c. sulfur dioxide
- d. phosphates

8. The greenhouse gases, otherwise called radioactively active gases includes _____.

- a. Carbon dioxide
- b. Methane
- c. Nitrogen oxide
- d. All of these

9. Trees help in reducing the pollution of our environment. Tree planting is an activity related to

- a. Forest conservation
- b. Coastal clean-up
- c. Solid waste management
- d. Environmental sanitation

10. What is the best program which people can engage in to promote a friendly-environment?

- a. Make posters about avoiding drugs
- b. Conduct an orchestrated community clean-up
- c. Conduct mural painting competitions on the theme “Sama-sama Tayo Tungo sa Malinis na Katubigan”
- d. Essay writing on cultural activity

11. The Republic Act 9275 is also known as the Philippine Clean _____ Act of 2004.

- a. Air
- b. Land
- c. Societal
- d. Water

12. What will happen if rat is missing in the food chain below?

rice plant --- rat ---snake

- a. The population of snake increases
 - b. The population of rice plants decreases
 - c. Snake start eating rice plants
 - d. The population of snake decreases and the population of rice plants increases
13. What role do microorganisms play in maintaining balance in nature?
- a. Recycle nutrients
 - b. Cause diseases to reduce human population
 - c. Prevent occurrence of catastrophic events
 - d. Agent of bio mediation
14. The population of rats which in controlled by the presence of the predators like snake is nature's means of maintaining balance? What environmental principle is referred to?
- a. Everything changes.
 - b. Everything is connected to everything else.
 - c. Nature knows best.
 - d. Nature is beautiful and we are stewards of God's creation.
15. Which of the following statements related to man's being stewards of nature or God's creations is not true?
- a. Human are co-natural with the environment that they live in.
 - b. Destroying or exploiting the environments affects the humans.
 - c. In the modern world dominated by digital technologies, humans have less need for nature.
 - d. Nature has the power to evolve and does not need humans but humans need nature to live.