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Research Article

Environmental awareness and participation of Filipino pre-service teachers

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ABSTRACT

Schools are accountable to cultivate environmental awareness and participation among future leaders. In an attempt to address this concern, this research determined the level of environmental awareness and involvement of teacher education seniors in one state university in the Philippines. Specifically, it focused on the respondents' level of environmental awareness in terms of issues and policies and level of environmental participation in terms of waste management, resource conservation, and environmental initiative. By employing the descriptive method of research with self-made questionnaire as its gathering tool. This paper found out that the respondents were unaware of environmental issues and policies, while they were moderately participative in activities relevant to environmental protection and conservation. With the findings of the study, enrichment activities offered by the researcher as well as considered by concerned authorities for its maximum actualization to enliven the once-perfect environment which human beings continuously destroy.

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INTRODUCTION

The environment provides everything for humans such as food, shelter, air, and water. Everything that surrounds people suffice not only their biological needs but also the material things that will give a triumphant return on their part. It is indeed a fact that the environment is beautiful and useful. However, it is worthy to note that the beauty of nature has limitations. It will not always prevail its positive side because it is very evident that it had been degraded by human activities (Groot, 1992; Hendryx, Ahern, & Zullig, 2013). The utilization of its usefulness has been abused by humans (Uduorji, 2009; Warner, Hamza, Oliver-Smith, Renaud, & Julca, 2010).

In this regard, schools, mainly educators' foremost duty is to offer quality environmental education to create awareness and participation among the citizens of a country (Boca & Saraçli, 2019; Cartea, 2005). Environmental education is aimed at changing people's behaviour to be more environmentally friendly to minimize the impact of human activities on the environment (Nijhuis, 2011; Tan & Pedretti, 2010). A person needs to be aware of his environment, as this is the foundation and starting point of literacy (Burchett, 2015;

Meilani, 2009; Turiman, Omar, Daud, & Osman, 2012). This can be understood by the quotation mentioned in the Belgrade Charter, which was issued in the environmental education workshop held at Belgrade, Yugoslavia in 1975 (Sola, 2014). It emphasizes the primary aim of environmental education which is to develop a world population that is aware of and concern about the environment as considerable as its associated problems, so that the community will have the knowledge, skill, attitudes, motivation, and commitment to work individually and collectively towards the solutions of current issues and prevention of new ones" (Tanner, 1980; UNESCO-UNEP, 1990).

The Philippines Republic Act No. 9512 Section 3, also known as the National Environmental Awareness and Education Act of 2008, has been encouraging the other institutions to participate in taking care of the environment. It consists of the responsibilities of citizens to value how to conserve, protect and restore natural resources and to attain sustainable development (Bedural, 2018; Chandran, Gunawardena, & Castro, 2017; Galang, 2010; Magalang, 2014; Valencia, 2018). Furthermore, Commission on Higher Education's (CHED), an agency to foresee tertiary education, set out the CHED Memorandum Order (CMO) No. 20, series of 2013. This document has revised the general education curriculum as well as the serious effort of the government consideration on the environment. The curriculum includes Natural Science (NS) courses specifically, Earth and Environmental Science. These courses were mandated to be included in teacher education programs aiming to open the future generation's mind about various issues and policies affecting the environment and several activities which possibly undertaken to address these matters. Additionally, the course National Service Training Program (NSTP) I and II were also included. It was designed to produce a civic-minded citizenry that can be an agent of change in the next generation (Commission on Higher Education, 2013).

To further promote a culture of environmental safeguarding among pre-service teachers, textbooks relevant to environmental issues were developed and validated (Ardan, 2016; Ilma & Wijarini, 2017). Moreover, according to Moseley, Reinke, and Bookout (2002) and Wilke (1985), classroom approaches and strategies to impart these topics like field trip, community immersion, outdoor exposure and volunteerism were also initiated by college educators to make the future teachers become more responsive and take an active part in guarding the earth's environment by making informed decisions and taking environmentally friendly actions.

Indeed, it is essential that pre-service teachers learned these courses and should be trained appropriately on environmental concepts and skills to impart the concepts as well as skills obtained to learners. They should be well-equipped with the knowledge and skills of methods or approaches in teaching environmental concepts and materials to inculcate the right understanding of an attitude towards the environment in the learners. Thus, these teachers must be environmentally competent (Lualhati, 2017; Tapia-Fonllem, Fraijo-Sing, Corral-Verdugo, & Valdez, 2017). Singh and Titi (2001) documented different results and findings brought by researches on the role of teacher education in promoting environmental education.

By considering the vital role of teachers in promoting environmental conservation, since it is in their hands lies, the next pool of environmental minded citizenry is conceptualized in this study. As an educator handling science-related courses for teacher education programs, this study is essential as this can reinforce obligation and commitment among faculty members in preparing education students to be excellent deliverers of environmental education.

There have been limited studies focusing on pre-service teachers' environmental awareness and participation, and the researchers found it deemed necessary to determine the level of awareness on environmental issues and policies as well as the level of participation in terms of waste management, resource conservation, and environmental initiative among teacher education seniors at Batangas State University-JPLPC Campus, Batangas, Philippines during the Academic Year 2018-2019. This study has an end view of disseminating its results and the actualization of enrichment activities. Thus, this is not just applicable to schools, but also it suits for the community. The researcher values the beauty of the environment, and this study will give birth for some constructive changes that will bring back to the once-perfect environment, which people knew it to be.

METHOD

Research design

The researcher used the survey type of descriptive research and used 21 Bachelor of Elementary Education and 106 Bachelor of Secondary Education seniors of Batangas State University who are officially enrolled during the academic year 2018-2019 as respondents. The researcher utilized the whole population or

127 respondents. Purposive sampling was used in which the researcher relies on her judgment when choosing members and numbers of the population to participate in the study (Groves et al., 2009). The researcher decided to accept them as respondents with the belief that the role of these future teachers in instilling and reinforcing foundational environmental knowledge, awareness, and participation among students is vital. Moreover, their success in finishing and passed the courses relevant to the environment, has made them more suitable to be respondents of this study.

There were three phases that this study has executed, namely, planning, data gathering, and analysis. The researcher was able to formulate the research problem by examining several resources and existing studies on environmental education. Her long years of experience handling environmental-related courses inspired and empowered her to conceptualize this study.

Instrumentation

To elicit the needed information for this study, the researcher used a self-made questionnaire. The first part of the questionnaire was 10 item statements to reveal their awareness of environmental issues and the other 10 item statements for policies as the second part. Part III was composed of 15 items to show their level of participation in terms of waste management, resource conservation, and environmental initiatives.

The interpretation of the computed mean for the level of environmental awareness and participation, the following mean ranges with their corresponding interpretations were used: 3.51-4.00: Strongly Agree-Highly Aware-Highly Participative; 2.51-3.50: Agree-Aware-Participative; 1.51-2.50: Slightly Agree-Moderately Aware-Moderately Participative; 1.00-1.50: Disagree-Not Aware-Not Participative.

To ensure the instrument's validity and reliability, the researcher sought the assistance of the three experts in the field of environmental science and statistician. The obtained .839 alpha coefficient suggests that the instrument was reliable.

Data collection procedure

The consent form is prepared and given to the respondent so that the research objectives are clearly understood and the respondent is willing to participate. They were oriented on the study's requirements and the confidentiality of the information to be collected among them as respondents of the study. Communication letter was also prepared to seek the approval from higher authorities to distribute the instrument. Upon approval, the researcher appropriately consulted the department's secretary for the schedule of the administration of the questionnaire. Also, she spread and retrieved the questionnaire. The gathered data were checked, tallied, scored, and treated through weighted mean.

RESULTS AND DISCUSSION

This part presents the data gathered together with the corresponding analysis and interpretation. The data are presented in tabular form organized sequentially, following the order of presentation of the specific problems posed in the study.

Environmental awareness of the respondents

This part of the study reveals the level of environmental awareness of the respondents. The data is presented in Table 1. The mean of 2.66 shows that majority of the respondents agreed that they are familiar with the effects of pollution. This signifies that the course instructors provided discussion for the better understanding and awareness of air pollution and possible approaches for environmental protection the students may undertake to solve this issue.

In general, the Table 1 shows that the respondents were not aware (2.49) with environmental issues. This implies that the school officials and faculty members might provide activities to develop further the respondents' awareness about the issues that were happening in their environment. One way of improving the respondents' awareness with regards to environmental issues is by making the subject multi-disciplinary. This means that highlighting environmental issues must intertwine with other disciplines. It was stated by school official that the integration of environmental education into teacher programs is necessary. It was also strengthened that some courses about the environment should take place in each subject area in teacher education; not only in biology but also in language and literature, mathematics, English language and literature, and computer teacher education.

Consequently, in line with Tekin (2012) and Wilke (1985), the teachers become more environmentally aware and can encourage the students to show environmental awareness. Moreover, Table 2 presents the level of awareness of the environmental policies of the respondents. It can be gleaned from the table that majority of the respondents were aware (2.49) of Solid Waste Management (SWM) Act and Garbage Law. These laws are in response to the pressing problem of garbage in the country. The results of the respondents awareness indicates that the local government unit's effort of implementing these policies has been active.

Table 1. Awareness of environmental issues

Item Statements	WM	VI
As a student, I know that …		
1. Global warming results in a tremendous amount of heat.	2.54	Agree
2. Natural habitats decrease in number because of extreme disasters.	2.51	Agree
3. Pollution severely affects the health of every organism, and it must be solved.	2.66	Agree
4. Priority project of the Local Government Unit in disseminating environment-related issues must be continued.	2.35	Disagree
5. Pollution lessens productivity, and job opportunities.	2.23	Disagree
6. Many coral reefs have been damaged because of cyanide and dynamite fishing.	2.72	Agree
7. Mining poses calamities and severe health hazards.	2.44	Disagree
8. Greenhouse gases from human activities are the most common cause of climate change.	2.41	Disagree
9. Forest degradation affecting the soil and water quality in the immediate area can hurt biodiversity over a range of connected ecosystem.	2.48	Disagree
10. Paper, plastics, and other materials that are burned can contaminate the air.	2.59	Agree
Composite mean	**2.49**	**Not aware**

Legend: WM- Weighted Mean; VI-Verbal Interpretation

Furthermore, 18 years after the enactment, these laws had been a system of garbage disposal up to present, resulting the increase of awareness and exposure among the citizens. According to Sapuay (2014), the laws have emphasized the waste diversion schemes such as waste segregation, composting, reuse, and recycling primarily. Acosta, Paul, Lao, Aguinaldo, and Valdez (2012) stated that it could also be said that if the laws are appropriately implemented, they are potential to address the current problems on SWM in the Philippines effectively.

Generally, Table 2 shows that the respondents were not aware (2.39) of environmental policies enacted in the country. To raise awareness around environmental issues, it is vital to start the conversation early. This result could be an indicator that environmental awareness should be part of school curriculum starting from elementary.

Table 2. Awareness of environmental policies

Item statements	WM	VI
As a student, I know that …	2.38	Disagree
1. Philippine Clean Water Act of 2004 applies to the water quality management in all water bodies.		
2. Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 restricts the importation, processing, sale, distribution, use, and disposal of chemical substances and mixture.	2.27	Disagree
3. Environmental Protection Act of 1990 empowers local authorities to deal with noise constituting a statutory nuisance.	2.27	Disagree
4. Philippine Mining Act of 1995 regulates the utilization of mineral resources in the country.	2.34	Disagree
5. Philippine Code of Sanitation requires food establishments in cities and municipalities to create a collection and disposal system.	2.36	Disagree
6. The Garbage Law of 1995 prohibits littering in public places.	2.49	Disagree
7. Philippine Ecological Solid Waste Management Act of 2000 encourages people to discipline themselves on proper waste disposal.	2.49	Disagree
8. P.D. 705, known as the Forestry Reform Code of the Philippines, emphasizes the protection, development, and rehabilitation of forest lands.	2.39	Disagree
9. Philippine Clean Air Act of 1999 promotes and protects the global environment to attain sustainable development	2.48	Disagree
10. Local Government Code of 1991 provides responsibilities to the local government of their waste management programs.	2.37	Disagree
Composite mean	**2.39**	**Not aware**

Legend: WM- Weighted Mean; VI-Verbal Interpretation

According to Abdul-Wahab and Abdo (2010), the early period of childhood is a critical phase in term of laying the foundation for developing concern regarding the environment. To prepare children for such responsibilities, they need a sound environmental education as a foundation at the childhood stage.

Environmental participation of the respondents

This part of the study shows the environmental participation of the respondents in terms of waste management, resource conservation, and environmental initiative. It displays the weighted mean for each statement, along with their equivalent verbal interpretation. Table 3 presents the respondents' level of participation in waste management.

Table 3. Environmental participation in term of waste management

Item statements	WM	VI
As a future teacher, I...		
1. Segregate waste at source.	2.42	Sometimes
2. Dispose of waste products properly.	2.36	Sometimes
3. Regulate the use of plastics and Styrofoam.	2.34	Sometimes
4. Treat and dispose of hazardous wastes properly.	2.47	Sometimes
5. Comply with standards for the surrounding wastewater.	2.38	Sometimes
Composite mean	**2.43**	**Moderately participative**

Legend: WM- Weighted Mean; VI-Verbal Interpretation

Noticeably, the respondents sometimes participate in waste segregation and disposal. Their moderate participation (2.43) on waste management may be addressed by teachers of all disciplines to enhance the likeliness to participate in recycling and composting schemes and to be able to make educated decisions regarding waste management options.

Everyone can contribute to a greener future by producing as little waste as possible and by helping to recycle and compost as much waste as possible. Schools, in particular, can help to achieve this aim through the conducted trainings and seminars regularly about solid waste management and allow the students as participants to provide them enough information about it (Best & Mayerl, 2013; Magante & Domingo-Almase, 2013).

Table 4 displays the level of environmental participation of the respondents on resource conservation.

Table 4. Environmental participation in terms of resource conservation

Item statements	WM	VI
As a future teacher, I...		
1. Turn-off air conditioning units after class hours.	2.58	Often
2. Turn-off lights during lunch breaks in our classrooms.	2.53	Often
3. Put on sleep mode computers or machines when not in use.	2.67	Often
4. A switch-off faucet that is not in use.	2.76	Often
5. Reuse scratch papers.	2.63	Often
Composite mean	**2.64**	**Participative**

Legend: WM- Weighted Mean; VI-Verbal Interpretation

Table 4 reflects that all items to reveal the pre-service teachers' participation in resource conservation were interpreted as often. This is a manifestation that they were participative (2.64) in switching/turning off lights and appliances when not in use and recycling papers. This signifies that young citizens should be educated about resources and environment to be adult citizens who responsible for the conservation of these resources and environment. Ferkany and Whyte (2012) and Klongyut, Singseewo, and Suksringarm (2015) stated that the contents should be learned effectively at primary education level by using an appropriate teaching method or holding a training session.

Moreover, Table 5 reflects the level of participation of the respondents in term of environmental initiatives. The table reflects that the respondents often participated in plant and trees preservation and conservation and in keeping the surroundings clean. On the other hand, they were sometimes engaged in fun run activities, zero plastic system, and buying eco-friendly products. In general, they were moderately participative (2.48) in environmental initiatives of the school.

This implies that the teachers need to encourage students to get further involve with environmental projects and or activities of the school. Environmental programs are everyone's concern, and environmental education is vital to guarantee a sustainable lifestyle in the long run. According to Punongbayan et al. (2014), the awareness accompanied by participation is the key for students to be involved in different activities and programs of the schools where the effective and sustainable implementation of the proper environmental conservation practices could be achieved.

Table 5. Environmental participation in terms of initiatives

Item statements	WM	VI
As a future teacher, I...	2.53	Often
1. Preserve and conserve plants and trees inside and outside the campus.		
2. Join environmental programs such as fun run and other related activities that promote love for the environment.	2.33	Sometimes
3. Patronize eco-friendly or green-labelled products.	2.48	Sometimes
4. Participate in the zero percent usage of plastic materials.	2.41	Sometimes
5. Keep the surroundings clean and teach others to care for the environment.	2.64	Often
Composite mean	**2.48**	**Moderately participative**

Legend: WM- Weighted Mean; VI-Verbal Interpretation

Enrichment activities that may be done to strengthen students' environmental awareness and participation

With the striking findings presented, the researcher came up with various activities to enhance students' environmental awareness and participation. These are shown in Table 6.

Table 6. Enrichment activities to strengthen students' environmental awareness and participation

Activity	Purpose	Description
1. Excursions, trips, and educational tours	To expose students to authentic situations to arouse their awareness about different environmental issues. Students can be aware of issues if they will be involved in the real condition of their surroundings.	This activity is a great help for the students to be aware and involves the issues and policies that are existing. Through science instructions led by the instructors, this can be achieved. There must be protocols about the existence of environmental issues in every science instruction because that is the gateway in solving environmental conflicts.
2. Multidisciplinary teaching	To promote pollution prevention by making the students aware of what the country is experiencing.	This could be done through the partnership of NSTP and other science instructions. The method of teaching in different subjects must be multidisciplinary. For example, in mathematics, the topics on it must involve the population level of in the Philippines. Literary selections in English must also deal with different environmental issues. Through this, different disciplines will be abridged by the same aim of environmental concern.
3. Project making that is environmentally incline	To encourage every student to be conscious of environmental policies for them to share it with younger generations.	Project making about environmental policies will be a great help for the students to be aware of it. It could be a project that will be used in and outside the school. This will create a huge impact not only to the students but also to others who will see the material. The instructor may also invite resource people from the Department of Environment and Natural Resources (DENR) to further strengthen the students' awareness of environmental issues and policies.

CONCLUSION

Educational activities to involve students in the protection of the environment is vital to create a sense of consciousness and participation and to help them acquire a knowledge of ecological principles aimed at ensuring a balance between the health of the individual, society, and the environment. It is within this premise that this study had been conducted. This study revealed that the respondents were not aware of environmental issues and policies while moderately participative in waste management and environmental initiatives. In consonance with the above-cited results, strengthening students' awareness on environmental issues and policies is encouraged to be done through different activities such as seminars, slogans, class reporting, term paper writing, poster-making, editorial writing, team-building, exhibitions, and campaigns. Second, student organizations like Go Green Club and YES-O Club to promote stewardship of the environment is suggested to involve them in authentic experiences.

Furthermore, the involvement in the said organizations strengthens their environmental participation. The highest official may create a local designation and assign one faculty member to initiate environmental programs for the campus. Through this office, all members of the campus will be enriched with knowledge about environmental concerns. The concerned authorities may consider the enrichment activities made by the researcher for its maximum actualization. Lastly, a similar study using other variables may be conducted to further gather data on environmental awareness and environmental participation among students in other schools.

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