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Methods and patterns of integrating environmental values in teaching science among pre-service elementary teachers

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Key words: Environmental awareness, Values education, Teaching methods, Environmental education, Preservice teachers

Abstract

This study endeavored to describe the methods and patterns employed by pre-service teachers in integrating environmental values in teaching elementary science. The study employed descriptive and evaluative research designs. The research participants were the twenty-seven pre-service elementary teachers. Results revealed that the topics taught by the pre-service elementary teachers pertain to the science curriculum themes of animals, plants, environment, and space. They employed integration of the different approaches, strategies, and techniques in teaching science with the appeal of interdisciplinary, contextualized, problem-based learning, and inquiry-based. Analysis and description of the environmental values infused showed strong adherence to anthropocentrism, biocentrism, and ecocentrism. In like manner, the pre-service teachers employed ten ways of presenting and eliciting environmental values in science teaching. Finally, environmental values were commonly integrated during the synthesis of the lesson and during the preliminary activities while the least observe was the integration of environmental values in all parts of the lesson. Findings imply that there is a need for a sustained integration of environmental values in teaching elementary science to ensure that deepening the values of environmental sensitivity and awareness of the learners. Implications of the study will guide Teacher Education Institutions to prepare future educators who have holistic, dynamic and interactive views in line with environmental education.

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Introduction

As the world is faced with critical environmental problems, educational systems must produce environmentally literate citizens who care about the environment and have sufficient knowledge about environmental issues to behave responsibly (Tuncer *et al*., 2009). Human activities, such as the accumulation of waste, destruction of ecosystems, and depletion of natural resources, have had a profound effect on the environment (WHO, 2005). These problems are discussed daily in communications media, pointing to the immediate need for every individual to possess scientific knowledge to understand or participate in the discussions. In the Philippine, science is one of the subjects taught in the K to 12 curricula. It is regarded as the most interesting subject in school curriculum. The nature of science as a subject can be explained to the point that it is generally referred as an organized knowledge. It is a scientific inquiry regarding nature and natural phenomena. Hence interest and appreciation for the "beautiful and the wonderful" are authentically felt. Science deals with real objects and events where authentic experiences are gained and learning is enhanced through direct learning exposure.

Science as a subject is considered also as the best avenue of enhancing environmental awareness and values of learners since it covers concepts and skills in life sciences, physics, chemistry, and earth sciences which are presented with increasing levels of complexity from one grade level to another in spiral progression, thus paving the way to deeper understanding of concepts and nurturance of values towards the environment.

It is evidential that teaching science is intertwined to environmental education which is one of its prominent goals is to develop environmentally literate citizens of the community. Environmental literacy generally includes students' knowledge, skills, attitudes and behavior related to environment (Merritt, 2008). Likewise, Goldman *et al.* (2006) defined an environmentally literate person as one who possesses the values, attitudes, and skills that enable knowledge to be converted into action, and also reflects his or her behavior towards the environment. Hence, teaching science requires effective integration of environmental values. This shows that the purpose of science education is not only on the total absorption of new knowledge and skills but more importantly, imbibing right values and attitudes towards the environment.

According to Carr (2011), teaching is a moral activity in which teachers have to consider the ethical complexity of teaching and the moral impact they have on their students. Teachers are the most important factor in promoting scientific literacy and environmental values. Therefore, the focus of Teacher Education Institutions in the Philippines must train future elementary teachers to become well prepared and equipped in teaching science subjects to young children. They must have a firm understanding of science and be abreast of the current technological advances affecting society every day. Teachers' role is crucial in promoting science literacy and environmental values in schools and society. Research on teachers' knowledge suggests that both teachers' subject matter knowledge and teachers' pedagogical knowledge are crucial to good science teaching and student understanding.

In the study of Corpuz *et al* (2011), they found out that student-teachers and professional teacher find difficulty in integrating value in the lesson. If ever there is an attempt, the integration is so superficial that it cannot touch minds and hearts or the integration is quite artificial that the value integrated seems forced just to comply with the mandate of value integration. They further noted that the ultimate purpose of information is formation and transformation. Saribas (2015) noted that teacher education programs are a good place to end such neglect. Future teachers need to be life-long learners who are scientifically and environmentally literate.

In like manner, with the goal of promoting environmental values in the classroom, Gheith (2013) found out a significant and positive relationship

between environmental value orientation and pro-environmental behavior of students leading to the conclusion that developing environmental values of students and deepening them, they become more inclined towards nature. Consistent to this, Magulod (2017) found out a significant relationship between environmental awareness and environmental attitude of students explaining that higher exposure of students about the environmental issues and problems the higher they demonstrate a positive attitude towards environmental care. Such findings clearly imply that in the classroom, articulation of clear environmental awareness and values of students can transform them to become vanguards of the environment.

In this respect, the paper seeks to draw attention to the necessity of investigating the patterns and methods of pre-service elementary teachers in integrating environmental values in teaching science. It specifically aimed to (1) identify the science concepts taught by the pre-service teachers; (2) describe the teaching approaches, strategies and techniques employed; (3) determine and analyze the environmental values infused in the teaching of science; (4) ascertain the methods and manner of integrating environmental values. This study hopes to contribute to the existing body of literature regarding how environmental values are articulated in science education. Moreover, the study addressed issues recently identified as research gaps in need of further investigation that will generate empirical evidence on which aspects necessitate improvement and intervention. In essence, the results of this study may specifically guide the Teacher Education Institutions in their curriculum development and policy-making that gear toward the development of environmentally sensitive future teachers.

Materials and methods

Method of Research

The study employed descriptive and evaluative research designs. The data were described and analyzed using codes and qualitative patterns. The sources of the environmental values, methods, and approaches used by the pre-service teachers were surveyed, identified and described. The descriptions were coded and analyzed for existing commonalities. The patterns and methods of presenting and integrating the different environmental values were described based on a questionnaire, their actual teaching, and the observations made by the researcher. Similar answers in the questionnaire and similarities in their lesson plans were tallied, compared, coded and validated.

Participants

The subjects of this study were the twenty-seven (27) pre-service elementary taught science topics during the period of their final demonstration teaching assigned to the different laboratory schools of the College of Teacher Education of Cagayan State University at Lasam. Fig. 1 presents the frequency and percentage distribution of the respondents as to gender. Nineteen females (70%) and eight males (30%) a total of twenty-seven (100%). This implies that there were more female respondents compared to females. The opportunities and experiences the participants gained in their experiential learning courses embedded them to have a clear perspective on the real learning environment in the elementary classrooms.

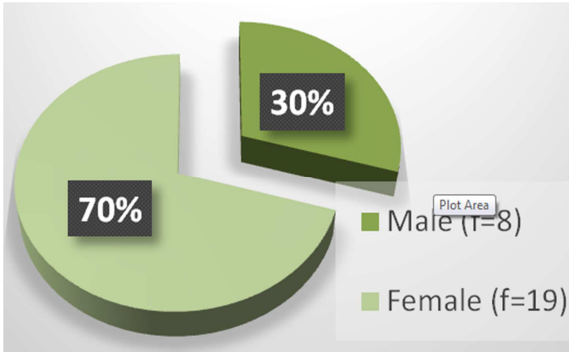

Fig1. Frequency and Percentage Distribution of the Participants when grouped according to gender.

Instruments

The study utilized a questionnaire checklist developed by the researcher. It consisted of three parts: (1) the topic of the pre-service teachers; (2) teaching approaches employed; and, (3) teaching strategies and technique used. In like manner, documentary analysis of the lesson plans was conducted to identify the environmental values infused by the respondents.

Finally, actual teaching observation was also conducted to identify the methods of presenting and patterns of integrating the different environmental values. The collection of data started with the researcher requesting permission from the associate dean of the College of Teacher Education. After having sought permission, the researcher conducted the observation of the final demo teaching of the pre-service elementary teachers. As an ethical consideration employed, the objectives of the study were explained to the participants and they were informed that an observation will be conducted for the completion of the study.

Data Analysis

The descriptions during the survey, actual observation, and analysis of the lesson plans were coded and tallied for commonalities. Frequency count and percentages were used to analyze the science concepts taught, teaching approaches employed, environmental values infused in the teaching science, teaching strategies and techniques employed, methods of presenting environmental values, and patterns of integrating environmental values.

Results and discussion

Table 1. Science Concepts Taught.

Learning Contents Taught in Science Subjects	Total	Percentage
▪ The Sun and the Nine Planets	2	7
▪ Objects are seen in the Sky	1	4
▪ Kinds of weather condition	2	7
▪ Layers of the Soil	1	4
▪ Sources of Water	1	4
▪ The Water Cycle	1	4
▪ Volcanic Eruption	1	4
▪ Precautionary Measures Before, during, and after the typhoon	2	7
▪ Weathering and Soil Erosion	3	11
▪ Managing Materials at Home	1	4
▪ Causes of Volcanic Eruption	3	11
▪ Earthquakes and Faults	2	7
▪ Living Things and Non-Living Things	2	7
▪ Vertebrates and Invertebrates	2	7
▪ Life Cycle of a Butterfly	1	4
▪ Special Adaptations of Plants	2	7
Grand Total	**27**	**100**

Table 1 presents the frequency and percentage distribution of the topics taught by the pre-service teachers in elementary science. A closer look at table three (11%) taught the topic weathering and soil erosion, three (11%) also taught causes of the volcanic eruption. Two (7%) pre-service teachers in each topic taught earthquakes and faults, precautionary measures before, during, and after the typhoon, The Sun and the Nine Planets, Kinds of weather condition. Moreover, one (4%) of pre-service teachers in each topic taught layers of soil, objects seen in the sky, sources of water, the water cycle, volcanic eruption, and managing materials at home. Further, two (7%) pre-service teachers in each topic taught living things and non-living things, vertebrates, and invertebrates, and special adaptations of plants. Only one (4%) of the pre-service teachers taught the topic life cycle of a butterfly.

The finding shows that most of the topic taught by the pre-service elementary teachers pertains to the science curriculum themes of earth and space, and living things and their environment which are based on the K to 12 curriculum guide. The topics taught provided them good avenues of integrating the different environmental values.

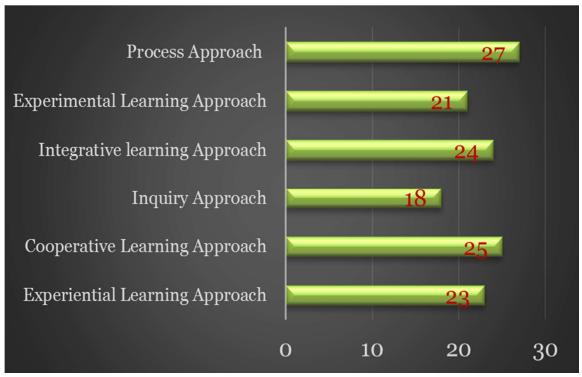

Fig1. Teaching Approaches.

The pre-service elementary teachers employed integration of the different approaches to teaching science. Fig. 1 presents that twenty-seven used process approach or guided discovery method (f=27). Also, twenty-five of them also used cooperative learning approach (f=25). There was twenty-four employed integrative learning approach (f=24),

twenty-three for experiential learning approach (f=23), twenty one used experimental learning approach (f=21), and eighteen also employed inquiry approach (f=18). The finding indicates that the pre-service teachers allowed the utilization of six different approaches in teaching science in the elementary. They manifested positive understanding that one of the prominent goals of science teaching is to develop the competence of the learners in searching for knowledge and information through the use of different approaches which can transform learners as scientifically, technologically, environmentally literate, and productive members of society who are critical problem solvers, responsible stewards of nature, innovative and creative citizens, informed decision makers, and effective communicators.

Moreover, based on the actual demonstration and analysis of the lesson patterns and methods, the pre-service teachers were able to articulate in their science teaching the approaches which are multi/ interdisciplinary, contextualized, problem/issue-based learning, and inquiry-based. These approaches are founded on the sound educational pedagogy which is constructivist, social-cognitive-based, learning style and brain-based learning. Johnson *et al* (2012) affirmed that guided inquiry, problem-based learning, and project-based learning are some of the approaches science teachers use to bring state-mandated science content alive for students through their own personal lenses. Meyers (2006) further affirms that the use of investigative, experiential and cooperative teaching-learning methods in environmental education addresses the issues of knowledge acquisition, skills, and attitude development.

Through these methods, learners are provided with the opportunity to carry out a guided inquiry into environmental issues.

Looking at the specific strategies and techniques employed, all the pre-service teachers used PROBEX (predict, Observe, Explain) (f=27), experimentation and actual investigation (f=27), and use of models in teaching (f=27). Consequently, twenty-six used making formal report (f=26), followed by seventeen who used demonstration (f=17), fifteen employed discussion (f=15), and thirteen for simulation (f=13). Moreover, there were eight who used role-playing (f=8) and only four employed the strategy of inviting resource person (f=4). It can be interpreted that the pre-service teachers employed different appropriate teaching strategies and methods in science. The use of a variety of teaching strategies and techniques aroused the learners' interest and stimulates them to actively participate in the quest for scientific information. According to Rivet & Krajick (2008), teachers who create effective science instructional environments contextualize instruction to appeal to students' interests and present new science concepts.

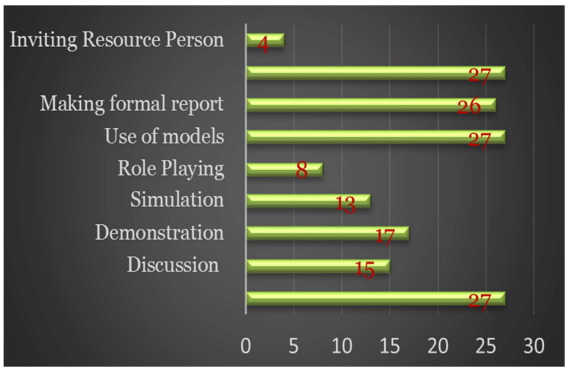

Fig2. Teaching Strategies and Techniques.

Table 4. Environmental Values Infused in the Teaching Elementary Science.

		Frequency (n=27)	Percentage	Rank
1.	Promotion of Sense of Compassion to Living Things	18	67	9
2.	Devotion to the principole of Pluralism	15	56	11
3.	Appreciation and respect for the environment	27	100	1
4.	Preparedness during Calamities and Disasters	14	52	12
5.	Conservation and protection of water, land and wildlife resources	23	85	5.5
6.	Wise utilization and management of household resources	10	37	14
7.	Promotion of the sense of commitment to	25	93	3

	Frequency (n=27)	Percentage	Rank
environmental protection			
8. Demonstration of scientific attitudes and values	19	70	8
9. Promotion of environmental accountability	24	89	4
10. Encouragement of pupils' motivation to participate in the school's tree planting activity	23	85	5.5
11. Promotion of Cleanliness and sanitation	20	74	7
12. Promotion of environmental sensitivity	26	96	2
13. Promotion of ecologically aware consumer behavior	13	48	13
14. Promotion of the awareness of climate change	17	63	10

The top seven environmental values integrated by the pre-service elementary teachers in teaching science are appreciation and respect to environment (f=27 or 100%), promotion of environmental sensitivity (f=26 or 96%), promotion of sense of commitment for environmental protection (f=25 or 93%), promotion of environmental accountability (f=24 or 89 %), conservation and protection of water, land, and wildlife resources (f=25 or 93%), encouragement of pupils to participate in tree planting activity (f=23, 85%), and promotion of cleanliness and sanitation (f=20 or 74%). In like manner, the bottom seven are demonstration of scientific attitudes and values (f=19 or 70%), promotion of sense of compassion to living things (f=18 or 67%), promotion of the awareness on climate change (f=17 or 63%), devotion to the principle of pluralism (f-=15 or 56%), preparedness during calamities and disasters (f=14 or 52%), promotion of ecologically aware consumer behavior (f=13 or 48%), and the least is wise utilization and management of household resources (f=10 or 37%).

It has been observed from the lesson plan and the actual demonstration teaching of the pre-service teacher, the most common value being integrated is appreciation and respect for the environment. The pre-service teachers support the idea that science as a subject deals everything in the natural environment and subject matter to be taught should leave pupils the value of environmental appreciation and respect. Hence, teaching science concepts should be infused with the value of promoting environmental sensitivity among the learners. They also adhere to the idea that science as a subject is a gateway for learners to develop their sense of commitment and accountability for environmental protection.

Further, this study revealed that the pre-service teachers were able to show understanding that conservation and protection of natural resources such as water, land, and wildlife are the values which should be developed among the learners, as a result, the believed that encouraging the learners to participate in different conservation activities such as tree planting activity will help learners become more environmentally aware. Also, promotion of cleanliness and sanitation was also infused as environmental value by the pre-service teachers. They were also able to relay that making the learners have the clear understanding on environmental conservation would lead to good public health conditions which are related to clean drinking water, the lesser occurrence of diseases, and healthier individuals. Further actual observation and analysis, the pre-service teachers articulated the value of demonstration of scientific attitudes and values, promotion of the sense of compassion to living things as well as the promotion of the awareness on climate change. They emphasized to their learners that they should become informed-citizens to make decisions about the reliability of the scientific information concerning their health, the environment, and socio-scientific relations. In like manner, devotion to the principle of pluralism, preparedness during calamities and disasters, and promotion of ecologically aware consumer behavior were also articulated as the emerging values reflected in the science teaching of the pre-service teachers. They were able to enunciate that learners should display readiness towards calamities at the same time their willingness to help different kinds of people. They also encouraged the learners to manifest caring behavior towards nature by purchasing materials

which are not detrimental to the environment and the same time practicing 3Rs (Reduce, Reuse and Recycle) as the basic principle to be incorporated in their daily life.

A deeper analysis of the different values infused by the pre-service teachers in science shows that values of anthropocentrism, biocentrism, and ecocentrism were incorporated. According to Gheith (2013), these environmental value orientations play an important role in environmental issues, and ought to be taken into account when attempting to find solutions for environmental problems that face different societies; such as global warming, loss of biodiversity, air and water pollution, and the destruction of wildlife. Dealing with these problems and actions taken to protect and preserve the environment depends on the environmental values held by an individual and his/her attitudes toward the environment. The strong adherence of the pre-service teachers to anthropocentrism shows that they believe that human beings are the one responsible to protect the environment because of its significant role to human life. Casey & Scott (2006) defined anthropocentrism as a human-centered value where humans need to protect and preserve the environment because human health and sustainability depend on the sustainability of natural resources, the environment must be protected as it holds benefits for future generations.

In relation to this, the pre-service teachers also infused values which are biocentrism. They cling to the idea that animals such as birds, plants and other living creatures in the environment have the equal rights to be protected. Zimmerman (2006) affirms that when values are centered on living organisms (biocentrism) indicate that all forms of life have the right to remain as members of the bio-system.

Finally, the pre-service teachers also observe the value of ecocentrism as the environmental value in science teaching. This value clings to the concept of giving moral consideration to the environment and the elements independent of human being. They rely also on the idea that nature deserves protection for its intrinsic value regardless whether useful to humans or not. Casey & Scott (2006) further claim that egocentrism is a nature-centered value and supporters of this approach tend to appreciate nature for nature itself; they believe that nature deserves protection for its intrinsic value, regardless of whether beneficial to humans or not.

Table 5. Methods of presenting the environmental values.

		Frequency	Percentage
1.	Elicited as a clarifying question by the teacher	4	15
2.	Elicited as an unfinished sentence written on the board	1	4
3.	Elicited as part of selection read	2	7
4.	Elicited in the pictures/video clips	7	26
5.	Presented as part of lesson objectives	6	22
6.	Elicited by answering a value sheet	1	4
7.	Elicited as a debating issue in the lesson	1	4
8.	Elicited by filling out graphic organizers	2	7
9.	Elicited as part of a song heard by the learners	2	7
10.	Elicited in the reflection and exit slips	1	4
	Total	27	100

As to the method of presenting the environmental values in science teaching by the pre-service teachers, seven (26%) elicited the environmental values by presenting pictures and video clips about the environment. Six (22%) presented the environmental values as part of the lesson objectives. It is also interesting to note that, two (7%) elicited the environmental values by filling out the graphic organizers on the board, two (7%) also elicited the values from the song presented by the teacher, and another two pre-service teachers (7%) elicited the environmental values from the selection read by the learners. Moreover, only one (4%) elicited the environmental values through the reflection and exit

slips given to the learners, one (4%) elicited values by answering an unfinished sentence written on the board, one (4%) allowed the learners to answer a value sheet, one (4%) elicited environmental values by presenting it as a debating issue in the lesson.

It can be interpreted from the data that those pre-service elementary teachers employed ten ways of presenting and eliciting environmental values in teaching science mostly by way of using multimedia presentations, allowing students to read the lesson objectives, and through a clarification question by the teacher. In the study of Komalasari (2017), the implementation of value-based interactive multimedia, personalizing lesson objectives, and employing values clarification strategies in teaching significantly affects students' characters.

Table 5. The manner of integrating environmental values are integrated.

	Frequency	Percentage
1. During the generalization of the lesson	8	30
2. During the assessment and testing period	3	11
3. During the preliminary activity as part of motivation and review	6	22
4. Integrated into the pupils' activity	3	11
5. During the application part of the lesson	4	15
6. During the assignment portion	2	7
7. Integrated into all parts of the lesson	1	4
8. Total	27	100

Investing the manner of integrating environmental values employed by the pre-service teachers, Table 5 shows that eight of them (30%) integrated the environmental values during the generalization of the lesson, six (22%) during the preliminary activities as part of motivation and review, there were also four (15%) during the application part of the lesson, three (11%) during the assessment period, three (11%) integrated during the application of the lesson. Likewise, two (7%) during the alignment period, and finally, only one (4%) integrated the environmental values in all parts of the lesson.

The findings of the study show that environmental values were commonly integrated by the pre-service teachers during the synthesis of the lesson and during the preliminary activities as part of motivation and review, while the least is the integration of environmental values in all parts of the lesson. Kimaryo (2012) explains that proper integration of values to science teaching enhances the learners' appreciation of the environment. Therefore, in order for the learners to be environmental literate, he/she has to possess knowledge and understanding of the environment, develop positive attitudes towards the environment and take action to address issues and problems that may arise in the environment. Komalasari (2012) asserts that character values must be integrated with learning across all of its components, including materials, methods, media, resources, and assessment.

Conclusion

Results of the study showed that the pre-service teachers are capable of integrating environmental values which are human-centered (anthropocentrism), living organism-centered (bio-centrism), and nature-centered (ecocentrism) in teaching science in the elementary level. They manifest effective utilization of different strategies and teachings in science teaching which are interactive, integrated, contextualized, experiential, multidisciplinary and collaborative. In like manner, methods of integrating values in their lesson mostly conducted by way of using multimedia presentations, personalizing lesson objectives, and through the value-clarification question. Further, environmental values were commonly integrated during the synthesis of the lesson and during the preliminary activities as part of motivation and review, while the least observe is the integration of environmental values in all parts of the lesson. With this, it, therefore, becomes imperative that the integration of values should be from motivation down to assessment/evaluation. Given such reality, there is, therefore, a need for the pre-service teachers to have training on the sustained integration of environmental value in science teaching.

References

Carr D. 2011. Values, virtues and professional development in education and teaching. International Journal of Educational Research **50,** 171-176.

Casey PJ, Scott k. 2006. Environmental concern and behavior in an Australian sample within an ecocentric – anthropocentric framework. Australian Journal of Psychology **58(2),** pp.57-67.

Corpuz BB, Salandanan GG, Rigor D V. 2006. Principles and Strategies of Teaching. Lorimar Publishing Inc., Quezon City, Metro Manila.

Gheith E. 2013. Environmental Value Orientations and Its Relation to Environmental Behavior among Petra University Students in Jordan. Journal of Education and Practice, Vol 4, No . **22,** pp 61-72.

Goldman D, Yavetz B, Pe'er S. 2006. Environmental literacy in teacher training in Israel: Environmental behavior of new students. J. Environ. Educ **38(1),** 3-22.

Johnson C, Zhang D, Kahle JB. 2012. Effective Science Instruction: Impact on High-Stakes Assessment Performance. Research in Middle-Level Education, Volume 35, Issue **9,** pp 5-14.

Kaplowitz MD, Levine R. 2005. How environmental knowledge measures up at a big ten university. Environmental Education Research **11(2),** 143-160.

Kimaryo LA. 2011. Integrating Environmental Education in Primary School Education in Tanzania Teachers' Perceptions and Teaching Practices. Retrieved fromhttp://www.doria.fi/bitstream/handle/10024/67481/kimaryo_lydia.pdf

Komalasari K. 2012. The Living Values-Based Contextual Learning to Develop the Students' Character. Journal of Social Sciences **8(2),** 246-257. DOI: 10.3844/jssp/2012.246.251.

Magulod G, Jr C. 2017. Climate Change Awareness and Environmental Attitude of College Students in one Campus of a State University in the Philippines. Journal of Biodiversity and Environmental Sciences, Vol 12, No. **2,** pp 211-220.

Maienschein J. 1999. Commentary: To the future argument for scientific literacy. Science Communication **21(1),** 75-87

Rivet A E Krajcik JS. 2008. Contextualizing Instruction: Leveraging Students' Prior Knowledge and Experiences to Foster Understanding of Middle School Science. Journal of Research in Science Teaching **45,** 79-100.

Roth C E. 1992. Environmental literacy: Its roots evolution and directions in the 1990s. ERIC/CSMME Publications, The Ohio State University, 1200 Chambers Road, Room 310, Colombus, OH 43212. Retrieved from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/conten t_storage_01/0000019b/80/24/44/47.pdf.

Saribas D. 2015. Investigating the Relationship between Pre-Service Teachers' Scientific Literacy, Environmental Literacy, and Life-Long Learning Tendency. Science Education International Vol. 26, Issue 1, **2015,** 80-100. Retrieved from https://files.eric.ed.gov/fulltext/EJ1056471.pdf

Tuncer G, Ertepinar H, Tekkaya C, Sungur S. 2005. Environmental attitudes of young people in Turkey: effects of school type and gender. Environmental Education Research **11(2),** 215-233.

World Health Organization. 2005. Ecosystems and human well-being. Retrieved from http://www.who.int/globalchange/ecosystems/ecosys.pdf

Zimmerman ME, translated by Rumieh M, Sh. 2006. Environmental Philosophy "From Rights to Radical Ecology. 2nd part, Alam almarifa.vol.333. Arabic resource