Journal for Re Attach Therapy and Developmental Diversities
eISSN: 2589-7799
2023 August; 6 (10s): 1062-1073

Psychology Behind Improving Environmental Literacy in Students' Education

Jasper L. Pastrano
Iloilo Science and Technology University
La Paz, Iloilo City, Philippines
jasper.pastrano@isatu.edu.ph

Received: 20- June -2023
Revised: 02- July -2023
Accepted: 15- August -2023

Abstract

The Philippine laws since 1977 have mandated incorporating environmental subjects into the fundamental education curriculum. After decades of execution, an assessment was piloted to appraise the present Environmental Literacy amongst Junior high school students in Iloilo City and Iloilo province, respectively, all located in the Philippines. The data will afford reference point information that is useful to outline the fitting environmental education programs. There are 500 students given a survey questionnaire. The data on environmental proficiency, verbal agreement, tangible commitment, environmental consciousness, and general environmental feelings was later collected. The data were analysed using chi-squared tests and Pearson's correlation coefficient. Results showed that the student's environmental literacy level was moderate, with significant correlations between ecological knowledge and sex, residence location, and grade in science; actual commitment and residence location; and general environmental feelings and grade in science. These outcomes suggest the necessity for supplementary and targeted environmental education programs in schools, especially in rural areas. Additionally, the study highlights the importance of gender-sensitive environmental education programs to increase environmental Literacy among female students.

Keywords: Environmental Literacy, Junior high students, environmental proficiency, commitment, environmental consciousness, gender, Science grade.

1. Introduction

Clinical The global community faces significant environmental tasks, including extreme weather events, floods, biodiversity loss, waste management, and contamination of natural resources. These issues directly impact our capacity for development while maintaining the well-being of people, flora, and fauna in an economically sustainable manner. Recognising the importance of addressing these concerns, the United Nations organised a conference in Stockholm in 1972, resulting in a declaration outlining 26 guiding principles. Principle 19 of this declaration establishes a framework for environmental education to foster responsible behaviour among young people and adults to protect and enhance the environment, thereby facilitating holistic human development. Furthermore, Principle 20 promotes scientific research and development related to environmental issues at national and multinational levels, enabling widespread access to current scientific knowledge and exchanging experiences to help solve environmental problems (United Nations, 1972).

In 1977, half a decade after the Stockholm Conference, the United Nations Education, Scientific, and Cultural Organization (UNESCO) organised a conference concentrating on environmental education. This gathering, carried out in partnership with the United Nations Environment Program (UNEP), took place in Tbilisi, Georgia, previously a segment of the USSR. At this event, attendees established and embraced a set of foundational guidelines for environmental teaching. These principles include: 1) effectively communicating information about the interdependence of political, social, economic, and ecological concerns in both rural and urban areas; 2) ensuring that every individual has the opportunity to safeguard and enhance nature through acquiring the necessary understanding, values, outlook, dedication, and skills; and 3) fostering the development of new behavioural patterns among individuals, groups, and entire communities that are more environmentally conscious. These principles are in the Tbilisi Declaration (1977).

In the same year, 1977, the Department of Education (DepEd) commenced incorporating environmental subjects into the school syllabus at all learning levels (FEED, Inc., 2018). Subsequently, in December of 2008, Republic Act No. 9512 was approved, also known as the National Environmental Awareness and Education Act of 2008.

This legislation reaffirms the State's commitment to protecting and promoting the individual's right to a balanced and health-giving ecology in harmony with nature. It recognises the crucial role of youth in nation-building. The law also highlights the importance of formal instruction in raising public consciousness about the significance of natural resources for fiscal progress and the need for environmental preservation and ecological stability to achieve sustainable countrywide advancement (The LAWPHiL Project, 2018). The legislation aims to cultivate a population of scientifically and technologically advanced individuals who are environmentally educated, productive society members, skilled problem solvers, reliable custodians of the environment, novel and inventive citizens, informed decision-makers, and efficient speakers (DEPED, 2016).

For sound decisions, it is essential to conduct scientific research on environmental-related education, specifically focusing on Environmental Literacy (EL), to assess how students acquire and comprehend knowledge. Consequently, this paper seeks to evaluate the EL levels of Junior High School (JHS) students, considering their profiles and science grades. The findings of this research will afford valuable baseline figures for the Philippines compared to other countries using the same measurement tool and support the enhancement of the science subjects within the framework of the K+12 program implemented by the DepEd.

2. LITERATURE REVIEW

Environmental Education (EE) is crucial in addressing the environmental challenges plaguing our contemporary world. It encompasses essential biophysical, economic, cultural, social, and political aspects of environmental concerns that merit recognition and exploration. The practice of evaluating environmental programs started as early as two centuries ago. However, recent evaluation systems have been initiated in recent times. Roth (1992) pioneered investigating EL, emphasising that its development is the fundamental purpose of environmental education, including nurturing responsible and proactive global and societal citizens. Schools take significant responsibility in preparing students to become productive and accountable citizens within society. The nurturing and enhancement of EL should be a primary objective within a holistic educational framework (Roth, 1992).

A study by McBeth and Volk (2010) noted that 8th-grade students demonstrated a higher level of ecological knowledge. This finding is consistent with the research conducted by Garcesa and Limjuco (2014), who reported that participants in their investigation exhibited the most significant degree of EL concerning their ecological knowledge.

O'Brien (2007) observed that learners demonstrated a moderately high level of environmental knowledge in their study. Similarly, Erdogan (2009) and McBeth & Volk (2010) reported a higher degree of ecological knowledge than EL. In a separate study conducted in Korea, Shin et al. (2005) sought to examine students' knowledge, emotions, and actions from the perspective of EL. Their findings indicated that Korean students' EL was accurately diagnosed, suggesting that the country's environmental education, including its national curriculum, instructional materials, and strategies, is on the right track.

Erdogan (2009) conducted a comparable study in Turkey intending to evaluate the EL levels of 5th-grade Turkish students, taking into account six environmental literacy components. The findings indicated that students' EL scores were moderate. Garcesa and Limjuco (2014) assessed EL among science educators in the Philippines. Their research demonstrated that teachers exhibited the highest stage of EL in environmental proficiency. At the same time, their pro-environmental behaviour was the weakest aspect. The result stemmed from integrating environmental topics into the syllabi of science educators.

3. OBJECTIVES OF THE STUDY

1. To evaluate the level of EL among Junior high students in the Philippines, including their knowledge, attitudes, and behaviours toward the environment.
2. To investigate the correlation between EL and school curriculum, sex, residence location, and school type of the students.
3. To identify the factors associated with the student's Academic Performance in Science and EL levels.

4. To contribute to the existing literature on EL in the Philippines by providing a baseline for future studies and informing policy development.
5. To create awareness about the significance of EL and the need for environmental education programs in the Philippines, emphasising the importance of sustainable development for the future.

4. PARADIGM OF THE STUDY

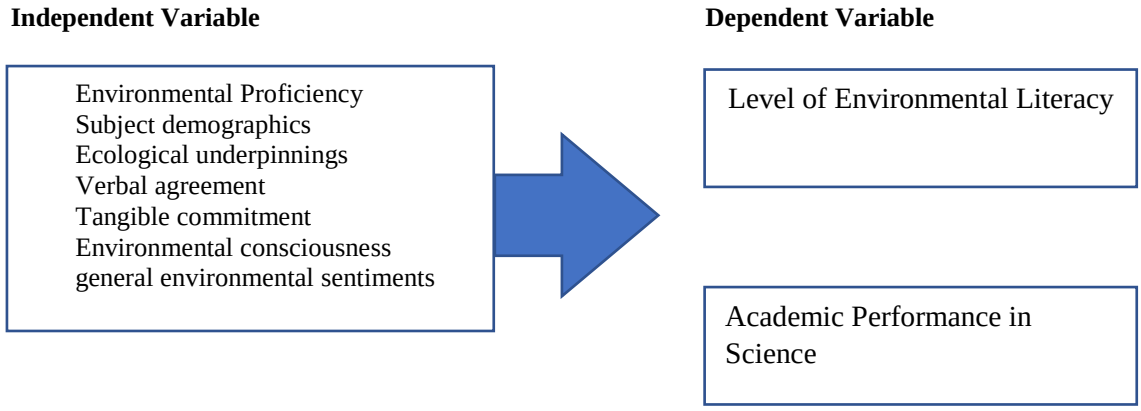

Figure 1. Schematic diagram of the research paradigm of the study.

Figure 1 presents the study's conceptual framework. This research delves into the link between the primary variable, EL and its facets, and the outcome variables, degree of EL and Scientific Academic Achievement. The EL components include subject demographics, ecological underpinnings, verbal agreement, Tangible commitment, environmental consciousness, and general environmental feelings.

The subject demographics include gender, school curriculum, school type, and residence location, offering a context to understand respondents' experiences affecting their EL. Ecological underpinnings evaluate respondents' understanding of ecological concepts such as ecosystems, biodiversity, and human impact, determining their comprehension of ecological interdependence. Moreover, verbal agreement measures respondents' intentions and willingness to engage in environmentally responsible behaviours. At the same time, actual commitment gauges their participation in such actions (e.g., recycling, energy conservation). Furthermore, the environmental consciousness examines respondents' emotional connection to the environment and awareness of human actions' consequences. Finally, the general environmental feelings assess overall attitudes towards the environment, including the perceived importance of environmental issues and motivation to act responsibly.

Moreover, the outcome variables, degree of EL and Academic Achievement in Science, gauge the participants' comprehensive environmental Literacy and academic success in science courses.

The level of EL combines the independent variable components, providing insight into respondents' knowledge, sensitivity, and commitment to environmental issues. Academic Performance in Science, potentially related to EL, is assessed through science grades during the third grading period of the school year.

The study explores the relationship between EL components and the dependent variables, aiming to understand EL's potential influence on student's academic performance in science and identify specific components with a more significant impact on academic achievement.

5. METHODOLOGY

The methodology used in this study, particularly in examining the EL of Junior High Students (JHS), involves a systematic and conceptual assessment of the methods utilised to gauge these students' environmental comprehension, viewpoints, and behaviours. This portion elaborates on the research blueprint, the participants involved, tools used for research, data collection methods, and the data analysis procedure. This document emphasises the credibility and consistency of its conclusions, which can be valuable for shaping environmental education strategies and methods.

5.1. Research Design

The research will employ a numerical approach and a descriptive-relational framework to gauge the EL levels of Philippines Junior High students.

5.2. Participants of the Study

A group of 500 students from five National High Schools in Iloilo City and its surrounding municipality in Iloilo province will be involved in the research. These students were selected based on a layered random sampling method.

5.3. Research Instrument

The survey, derived from the Middle School Environmental Literacy Survey (MSELS) tool, is intended to gather data across six areas: (1) participant background, (2) environmental capability, (3) oral endorsement, (4) concrete involvement, (5) environmental awareness, and (6) overall environmental sentiments. This survey has been modified to reflect the specific circumstances of the Philippines. It comprises multiple-choice queries, rated on Likert scales. Participants are expected to finish the survey in about 60 minutes.

5.4. Data Gathering Procedure

The school heads obtained permission to facilitate the questionnaire's efficient distribution. Adhering to the set guidelines, the principal assigned class mentors who specified the schedule for distributing the questionnaire. Once filled out, the class mentors returned the questionnaires to the investigator, who will then analyse the data in line with the research needs.

5.5. Data Analysis

Data will be inputted using Microsoft Excel, and the analytical process will be conducted using SPSS. Descriptive and inferential statistical techniques, including Chi-squared tests and Pearson's R, were applied to identify differences in EL among students from diverse educational settings and backgrounds. Furthermore, multiple regression analysis will identify elements associated with elevated EL levels in students.

Table 1 presents the categories of EL and the MSELS. Part I focuses on the background of the participants, while Part II evaluates environmental proficiency, tailoring questions to resonate with Filipino students. Part III captures the students' views on the environment. Additionally, Part IV evaluates the actions taken by the students, Part V captures their cheerful disposition towards the environment, and Part VI indicates the positive sentiments of the participants.

Table 1. Environmental Literacy categories, MSELS parts

Categories of Environmental Literacy	Parts of MSELS	N Items
Subject Demographics	Personal Insights	5
Ecological Underpinnings	Understanding Ecology	16
Verbal agreement	Your Environmental Perspectives	12
Tangible Commitment	Action Taken for the Environment	11
Environmental Consciousness	Your Relationship with Environmental Awareness	11
General Environmental Sentiments	Your Emotional Connection to the Environment	2

6. RESULTS AND DISCUSSION

As depicted in Table 2, the demographic profile of the 500 respondents reveals that 57.4% were female, representing the majority, while 42.7% were male. This gender distribution aligns with previous research that has reported no significant gender differences in EL among middle school students (Zhang & Chen, 2016). Furthermore, concerning the school curriculum, 85.3% of the respondents were enrolled in regular classes, while 14.7% attended special science classes. A minor percentage of students in specialised science courses suggests that few educational establishments have the DepEd's approval to conduct such advanced programs and have the essential tools, including expert educators, apparatus, and laboratory devices. Earlier studies highlight that student in science-focused classes tend to have greater environmental understanding and consciousness than their non-science class counterparts (Wu et al., 2018).

Furthermore, regarding school type, 64.7% of the respondents attended public high schools, 20.10% attended state university lab schools, and 15.2% attended private high schools. Earlier research has suggested that students from private institutions tend to possess greater environmental understanding and consciousness than public school students (Adomssent et al., 2019). The information reveals that 56.9% of participants reside in city regions, with the remaining 43.1% based in countryside settings. Prior research has often indicated that students from urban settings typically exhibit enhanced environmental understanding and consciousness compared to those from rural areas (Fien et al., 2013).

Table 2. Subject Demographics

Profiles		Frequency, n =500	Percentage
Sex	Female	287	57.4%
	Male	213	42.7%
School Curriculum	Regular class	426	85.3%
	Special science class	74	14.7%
School type	Public High school	324	64.7%
	State University Lab School	101	20.1%
	Private High school	76	15.2%
Residence location	Urban	284	56.9%
	Rural	216	43.1%

Table 3 shows the Scholastic Performance of JHS Science learners during the third grading period. The data revealed that the majority of the students (34.8%, 31.4%) received a science grade of either "Fair" or "Good", respectively. This suggests that most students in the study have at least a basic understanding of science concepts. However, it is worth noting that almost (9.3% and 2.5%) of the students received a science grade of "Poor" and "Very Poor", respectively. These students may need help developing EL and a stronger foundation in science knowledge and skills.

Interestingly, 19.1% and 2.9% of students achieved science grades of "Very Good" and "Excellent" science grades, respectively. This distribution provides a clear picture of the student sample's academic performance. Many students fall into the category of average achievers, with only a few reaching the very top or bottom performance tiers. The figures also indicate opportunities to enhance scientific understanding and capabilities among Junior High students.

Overall, the data in Table 3 highlights the importance of science education in developing EL among JHS students. By providing students with a strong foundation in science knowledge and skills, we can help them better understand and address environmental issues. Furthermore, research has suggested that science education and EL are closely related. Studies have found that students with higher levels of science understanding and skills tend to have higher levels of EL (Ryan et al., 2016).

Table 3. Student's Academic Performance in Science

Science Grade	f	Percentage	Description
70 – 74	14	2.80%	Extremely Low
75 – 79	50	10.03%	Below Average
80 – 84	169	33.80%	Average
85 – 89	149	29.80%	Above Average
90 – 94	100	20.00%	High
95 – 99	18	3.60%	Exceptionally High

Table 4 displays the EL gradings of Junior High students, divided into five distinct segments. The findings indicate a result of (M=2.4; SD=0.5), suggesting a pronounced level of EL from the targeted client. The data connotes that irrespective of factors like gender, class variety (either regular or specialised science), school category (public, private, or experimental), or living area (city or countryside), students consistently demonstrated a significant understanding of environmental matters. The average ratings spanning the four classifications, specifically from 1.1 to 1.4, stands at (M=2.4). The results suggest that the environmental education programs initiated by the DepEd in 1977 have benefited students' knowledge growth. These observations align with those of McBeth & Volk (2010), who reported enhanced ecological understanding among 8th graders, and Anwar, El Sergany, & Ankit (2017), who noted the pinnacle of EL in their participants concerning ecological comprehension. In addition, today's students exhibit a profound grasp of their surroundings, likely influenced by the prevalent accessibility to social media, online platforms, and other information sources. Leveraging this knowledge into actionable steps might play a role in counteracting climate alterations and curtailing global temperature rise.

Table 4. Students' Environmental Literacy

Categories	Mean	Std. Dev	Interpretation
1.1 Environmental Proficiency	2.44	0.49	High
1.2 Verbal Agreement	2.31	0.43	High
1.3 Tangible Commitment	2.32	0.56	High
1.4 Environmental Consciousness	2.48	0.52	High
1.5 General Environmental sentiments	1.37	0.64	Very High
Grand Mean	2.39	0.46	High

Table 5 examines the relationship between students' EL and gender. A notable association was observed between gender and the categories of concrete involvement and environmental awareness in EL, with p-values below .05. However, no significant relationship was observed between sex and environmental proficiency, verbal commitment, or general environmental feelings.

Studies examining the link between gender and EL have produced varied outcomes. Some research, for instance, indicates that females might possess greater environmental Literacy (Schultz, 2001). The significant relationship between actual sex commitment and environmental sensitivity in this study may imply that females possess higher levels of these aspects than males. This observation resonates with prior studies suggesting that females often

bear a heightened sense of duty towards environmental concerns and are more inclined to adopt eco-friendly practices (Gardner & Stern, 2008). How boys and girls are socialised might also shape their perspectives and actions related to the environment (Ojala, 2012).

Various studies have reported differing results regarding gender and EL components. These findings highlight the dynamic nature of respondents and suggest that further research is needed to identify significant indicators in students' EL.

Table 5. Environmental Literacy Level when compared to sex

Categories	Chi-squared (X^2)	p-value
Environmental Proficiency	0.30	0.86
Verbal Agreement	30.54	0.19
Tangible Commitment	47.03	0.02*
Environmental Consciousness	44.36	0.01*
General environmental sentiments	3.21	0.78

**p-value is significant at the .05 level.*

Table 6 presents the outcomes of the chi-squared evaluation to probe the association between the school syllabus and the five dimensions of EL assessed in the research. The p-value represents the probability that the observed relationship occurred by chance. Based on the table, the ecological knowledge level and environmental consciousness significantly correlate with the school curriculum (p-value = 0.00). The verbal agreement also significantly correlates with the school curriculum (p-value = 0.01). However, the tangible commitment and general environmental sentiments do not significantly correlate with the school curriculum (p-value = 0.63 and 0.20, respectively).

The results suggest that students in special science classes have higher environmental proficiency, environmental consciousness, and verbal agreement than those in regular classes. The findings align with earlier studies indicating that students enrolled in dedicated science programs tend to exhibit heightened environmental understanding and consciousness (Bryce & Blaine, 2018). Furthermore, this study's outcomes imply that tailored science curricula have an edge in fostering EL over standard classes.

The students in special science classes may have higher ecological knowledge, environmental proficiency, and environmental consciousness than regular class students. These results support the argument that environmental education should be integrated into science education to improve EL (Kempton & Hartley, 1995). Additionally, research has shown that environmental education programs can help promote EL and pro-environmental attitudes among students (Hungerford & Volk, 1990). Nonetheless, the structure and execution of environmental education initiatives can differ significantly, with specific programs proving more beneficial than others. Moreover, research indicates that experiential, practical methods in environmental education can successfully enhance students' ecological understanding and their awareness of the environment (Cutter-Mackenzie et al., 2018).

Therefore, the findings from this research regarding the correlation between EL and school curriculum are consistent with previous research. These findings suggest that efforts to promote environmental education and literacy should consider the design and execution of educational programs and the potential differences in effectiveness based on the school curriculum.

Table 6. School Curriculum and Environmental Literacy Correlation

Categories	Chi-squared (X^2)	p-value
Environmental Proficiency	15.06	0.00*

Verbal Agreement	43.86	0.01*
Tangible commitment	24.88	0.63
Environmental Consciousness	54.58	0.00*
General environmental sentiments	8.52	0.20

**p-value is significant at the .05 level.*

Table 7 displays data illustrating the correlation between EL levels and the type of school. This data covers five facets: environmental proficiency, verbal concurrence, tangible engagement, environmental awareness, and overarching environmental sentiments. The analysis used a chi-squared test to discern relationships between these categorical aspects.

For Ecological knowledge, the chi-squared value stands at 6.20 with a p-value of 0.18. This means there needs to be a link between ecological understanding and the kind of school attended. Nevertheless, past studies indicate that schools' focused environmental education can elevate students' ecological comprehension (Kopnina & Blewitt, 2014). Thus, integrating environmental studies into academic syllabi is crucial for nurturing this understanding. Meanwhile, the chi-squared value for verbal concurrence is 58.40, with a p-value of 0.19. This insinuates that student, regardless of their school type, express comparable verbal acknowledgement of environmental concerns. Nevertheless, educational studies demonstrate that ingraining environmental subjects in schools can mould students' environmental perceptions and actions (Blewitt & Cullingford, 2004).

Similarly, the tangible engagement chi-squared value is 67.20 with a p-value of 0.15, suggesting no strong tie between actual engagement and school type. It implies that students demonstrate analogous commitment levels to environmental issues regardless of their educational institution type. Nevertheless, it is well-documented that educational programs emphasising the environment can refine students' green practices (Stern et al., 1999).

As for environmental awareness, the chi-squared value is 66.85 with a p-value of 0.08, showing no significant linkage between environmental awareness and the kind of school. However, as per earlier research, integrating environmental themes into academic programs can boost students' environmental perceptions and actions (Kopnina & Blewitt, 2014).

Lastly, the overarching environmental sentiment has a chi-squared value of 23.85 and a p-value of 0.02*, indicating a noteworthy correlation with the school type. This highlights that student from varying institutions hold distinct overall environmental feelings. Certain schools may nurture a more positive environmental sentiment than others. Again, the literature affirms that structured environmental curricula can amplify students' green perspectives (Blewitt & Cullingford, 2004).

The analytical findings indicate no notable link between environmental proficiency, verbal agreement, tangible commitment, environmental consciousness, and the type of school. Yet, a distinct correlation exists between general environmental sentiments and the school category. This underscores the importance of embedding environmental education in school programs to bolster students' environmental perspectives and actions.

Table 7. School Type and Environmental Literacy Correlation.

Indicators	**Chi-squared (X^2)**	**p-value**
Environmental Proficiency	6.20	0.18

Verbal Agreement	58.40	0.19
Tangible commitment	67.20	0.15
Environmental Consciousness	66.85	0.08
General environmental sentiments	23.85	0.02*

**p-value is significant at the .05 level.*

Table 8 represents the level of EL when associated with residence location. The outcome shows that the chi-squared value for environmental proficiency is 13.63, and the p-value is 0.00*, demonstrating a significant relationship amongst environmental proficiency and residence location. The observation indicates that people from diverse locales possess varying environmental aptitudes. Specifically, urban dwellers have less environmental expertise than their rural counterparts. This aligns with earlier studies, which posited that urban residents often have a diminished bond with nature and display lesser environmental awareness than those in rural settings (Lyytimäki & Tapio, 2017).

Moreover. the chi-squared value for tangible commitment is 31.54, and the p-value is 0.17, showing no significant correlation between tangible commitment and residence location. This finding suggests that individuals living in different areas are similar in their tangible commitment to the environment. The chi-squared value for actual commitment is 46.59, and the p-value is 0.02*, indicating a significant association between actual commitment and residence location. This finding suggests that individuals living in different areas differ significantly in their tangible commitment to the environment, with individuals living in rural areas exhibiting higher levels of tangible commitment than those living in urban areas. This finding is similar to previous research that found that individuals residing in rural areas exhibit more pro-environmental behaviours than those inhabiting urban areas (Van den Berg, Koole, & Van der Wulp, 2003).

Additionally, the chi-squared value for environmental consciousness is 37.11, and the p-value is 0.07, indicating no significant association between environmental consciousness and residence location. This finding suggests that individuals living in different areas do not differ significantly in their environmental consciousness. Studies indicate that environmental instruction can bolster people's perspectives and actions (Chawla, 1998), underscoring the importance of embedding environmental teachings within educational programs. Additionally, the chi-squared metric for general environmental views stands at 8.87, with a p-value of 0.18, signifying no noteworthy link between general environmental sentiments and the place of residence. This finding suggests that individuals living in different areas do not differ significantly in their general environmental feelings. Overall, Table 8 data analysis shows a significant association between environmental proficiency and tangible commitment and residence location, with individuals living in rural areas exhibiting higher levels of ecological knowledge and tangible commitment than those living in urban areas. However, there is no significant relationship between verbal agreement, environmental consciousness, general environmental sentiments, and residence location.

Table 8. Residence Location and Environmental Literacy Correlation

Cohorts	Chi-squared (X^2)	p-value
Environmental Proficiency	13.63	0.00*
Verbal Agreement	31.54	0.17
Tangible commitment	46.59	0.02*
Environmental Consciousness	37.11	0.07
General environmental sentiments	8.87	0.18

**p-value is significant at the .05 level.*

Table 9 presents the association between levels of EL and academic achievements in science. Pearson's r correlation coefficient was utilised to evaluate the connection between these two elements. The findings reveal a reasonably positive correlation (r=0.41) between environmental aptitude and science grades, suggesting that students with superior environmental understanding often achieve better grades in science. This finding mirrors past research, which has identified a positive correlation between environmental comprehension and success in science academics (Boz et al., 2018).

Moreover, the results showed a significant negative correlation (r=-0.28) between general environmental feelings and grades in science, indicating that students who scored higher in environmental feelings tend to score lower in science grades. This finding is unsurprising as environmental consciousness, such as emotional connection or empathy towards the environment, may not necessarily reflect knowledge or understanding of scientific concepts (Stern, 2000). Moreover, the results showed low or negligible inverse correlations with Academic Performance in Science on verbal and tangible commitment and environmental consciousness. This finding suggests that students' commitments and sensitivity towards the environment may not necessarily affect their performance in science. Overall, the findings suggest that environmental knowledge is positively related to academic achievement in science.

Table 9. Science Academic Performance and Level of Environmental Literacy

Cohorts	Pearson's r	Degree of correlation	p-value
Environmental Proficiency	0.41	Moderate correlation	0.00*
Verbal Agreement	-0.18	Very low	0.02*
Tangible commitment	-0.02	Inverse negligible	0.78
Environmental Consciousness	0.00	Inverse negligible	0.96
General environmental f sentiments	-0.28	Inverse low correlation	0.00*

**p-value is significant at the .05 level.*

7. CONCLUSIONS AND RECOMMENDATIONS

This research findings indicate that after four decades of Philippine environmental education, the JHS respondents have achieved a high level of EL, specifically in ecological knowledge, verbal commitment, actual commitment, environmental sensitivity, and general environmental sentiments. Concurrently, the results reveal a significant relationship between gender and actual commitment and environmental sensitivity. At the same time, the school curriculum was discovered to be significantly associated with verbal agreement, environmental proficiency, and environmental consciousness. Moreover, meaningful connections were identified between general environmental sentiments and school type, environmental proficiency, and tangible commitment to residence location. Furthermore, a moderate correlation was observed between academic performance and environmental proficiency. Moreover, the findings suggest that efforts to improve EL among high school students in the Philippines should focus on enhancing tangible commitment and environmental consciousness, particularly among students from public schools. Moreover, interventions to improve ecological knowledge and general environmental feelings may also help enhance academic achievement.

Furthermore, the information showcased offers a critical understanding of the level of EL of high school students in the Philippines. The results underline the importance of persistent initiatives to elevate environmental learning in the nation, primarily focusing on bolstering real engagement and environmental awareness among students in government-run schools. Such endeavours advocate for eco-friendly mindsets and actions in upcoming generations, paving the way for a greener tomorrow.

References

1. Adomssent, M., Weiss, J., & Höltge, J. (2019). Environmental knowledge and attitudes: Exploring differences between public and private schools. Journal of Environmental Education, 50(2), 117-126.

2. Anwar, S., El Sergany, M., & Ankit, A. (2017). Middle School Students' Environmental Literacy Assessment in Thessaloniki Greece. (pp. 198-209). Dubai: Research Gate. Retrieved from https://goo.gl/F8dK2S
3. Barratt, R., Farnham, C., & Sturgeon, W. (2018). Environmental education in Indonesia: A literature review. Environmental Education Research, 24(8), 1114-1130.
4. Bartosh, O. (2003). Environmental Education: Improving Student Achievement. Retrieved from http://www.seer.org/pages/research/Bartosh2003.pdf
5. Blewitt, J., & Cullingford, C. (2004). The effectiveness of environmental education in schools: A review. Education 3-13, 32(3), 19-25.
6. Boz, Y., Akkaya, G., & Aydin, H. (2018). The impact of environmental literacy level on academic achievement in science and technology courses. Journal of Education and Training Studies, 6(1), 96-102.
7. Bronfman, N. C., Cisternas, P. C., Vázquez, E. L., de la Maza, C., & Oyanedel, J. (2015). Understanding Attitudes and Pro-Environmental Behaviors in a Chilean Community. Sustainability , 14133-14152.
8. Bryce, J., & Blaine, D. (2018). Science education and the environment in the UK: Past, present, and future. In The Palgrave Handbook of Education for Sustainable Development (pp. 205-222). Palgrave Macmillan, Cham.
9. Cutter-Mackenzie, A., Edwards, S., Moore, T., Boyd, W., & Skouteris, H. (2018). Investigating the impact of nature play on young children's play, learning, and development: A systematic review. International Journal of Environmental Research and Public Health, 15(11), 2413.
10. DEPED. (2016, August). K to 12 Curriculum Guide in Science. Retrieved March 10, 2018, from Department of Education: https://goo.gl/WJD8aQ
11. Dunlap, R. E., & Van Liere, K. D. (1978). The "new environmental paradigm": A proposed measuring instrument and preliminary results. The Journal of Environmental Education, 9(4), 10-19.
12. Erdogan, M. (2009, January). Fifth Grade Students' Environmental Literacy and the Factors Affecting Students' Environmentally Responsible Behaviors. Turkey. Retrieved from https://etd.lib.metu.edu.tr/upload/3/12610357/index.pdf
13. FEED, Inc. (2018, March 10). Fostering Education & Environment for Development, The Philippines. Retrieved from https://goo.gl/7TFbDJ
14. Fien, J., Yencken, D., Sykes, H., & Wilson, A. (2013). Environmental education research and the rural-urban divide. Environmental Education Research, 19(2), 167-182.
15. Garcesa, R. D., & Limjuco, R. P. (2014). Environmental Literacy and integration of environment issues among science teachers in Region XI: Basis for training design. UIC Research Journal, 187-205.
16. Heyl, M., Díaz , E., & Cifuentes , y. (2013, January 11). Environmental attitudes and behaviors of college students: a case study conducted at a chilean university. Revista Latinoamericana de Psicología. doi:doi: 10.14349/rlp.v45i3.1489
17. Hidayah, A., Agus, H., & Aji, A. N. (2019). Developing environmental Literacy for high school students through field trip activity. International Journal of Instruction, 12(2), 137-150.
18. Hsu , S. J., & Roth, R. E. (2006). An Assessment of Environmental Literacy and Analysis of Predictors of Responsible Environmental Behavior Held by Secondary Teachers in the Hualien Area of Taiwan. Environmental Education Research, 229-249.
19. Hungerford, H. R., & Volk, T. L. (1990). Changing learner behavior through environmental education. The Journal of Environmental Education, 21(3), 8-21.
20. Kaya, E., Akilli , M., & Sesek, F. (2009). An Investigation of High School Students' Environmental Attitudes in Terms of Gender. Mehmet Akif Ersoy University Journal of Education, 43-54.
21. Kempton, W., & Hartley, J. A. (1995). Environmental values in American culture. MIT press.
22. Keselman, A., Levin, D. M., & Merenlender, A. M. (2019). The relationship between science achievement and environmental Literacy. Environmental Education Research, 25(4), 477-493.
23. Kopnina, H., & Blewitt, J. (2014). Education for sustainable development (ESD): The turn away from 'environment' in environmental education? Environmental Education Research, 20(3), 369-383.
24. Lyytimäki, J., & Tapio, P. (2017). Nature as a nuisance? Ecosystem services and disservices to urban lifestyle. Journal of Cleaner Production, 161, 120-129.
25. McBeth, B., Hungerford, H., Marcinkowski, T., Volk, T., & Meyers, R. (2008). National Environmental Literacy Assessment Project: Year 1, National Baseline Study of Middle Grades Students Final Research Report. Retrieved from https://goo.gl/CD7tCP
26. McBeth, W., & Volk, T. L. (2010). The National Environmental Literacy Project: A Baseline Study of Middle Grade Students in the United States. The Journal Of Environmental Education, 55–67. Retrieved from https://goo.gl/ZXBjy4

27. O'Brien, S. R. (2007). Indications of environmental Literacy: using a new survey instrument to measure awareness, knowledge, and atitudes of university-aged students. IOWA State University Digital Repository. Retrieved from htp://lib.dr.iastate.edu/rtd
28. Roth, Charles E.(1992). Environmental Literacy: Its Roots, Evolution, and Directions in the 1990s. ERIC Institute of Education and Sciences.Retrieved from https://files.eric.ed.gov/fulltext/ED348235.pdf
29. Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. Journal of Social Issues, 56(3), 407-424.
30. Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support
31. The LAWPHiL Project. (2018, March 10). Arellano Law Foundation. Retrieved from https://www.lawphil.net/statutes/repacts/ra2008/ra_9512_2008.html
32. The Tbilisi Declaration. (1977). The Modern Impetus for EE. Retrieved March 12, 2018, from Environmental Education: https://www.gdrc.org/uem/ee/1-4.html
33. UNESCO. (1978, November). Records of the General Conference Twentieth Session. Retrieved from United Nations Educational Scientific and Cultural Organization: http://unesdoc.unesco.org/images/0011/001140/114032E.pdf
34. UNITED NATIONS . (1972). Report of the United Nations Conference on the Human Environment. Stockholm. Retrieved from http://www.un-documents.net/aconf48-14r1.pdf
35. Van den Berg, A. E., Koole, S. L., & Van der Wulp, N. Y. (2003). Environmental preference and restoration: (How) are they related? Journal of Environmental Psychology, 23(2), 135-146.
36. Wang, C. Y., & Tsai, C. C. (2017). The impact of a scientific inquiry-based learning environment on early elementary school students' science literacy in science and social studies. Journal of Educational Psychology, 109(2), 229-243.
37. Wu, H. C., Lee, Y. Y., & Wang, C. Y. (2018). The relationships between students' science learning achievement, attitudes and learning processes in a science-oriented summer camp. International Journal of Science Education, 40(1), 68-84.
38. Zhang, H., & Chen, J. (2016). Gender differences in environmental Literacy among middle school students: A comparative study of Chongqing, China and Tampa, Florida, USA. Environmental Education Research, 22(3), 310-325.