



## Environmental Education and Pro-Environmental Behavior Among Um Peñaplata College Students

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**ABSTRACT:** This study aimed to determine the level of environmental education, the level of pro-environmental behavior, and to examine the relationship between environmental education and pro-environmental behavior among UM Peñaplata College students. The research approach was quantitative, a descriptive-correlational design was employed. Thus, the researchers used mean, Pearson Product Moment Correlational, and regression for data analysis and interpretation. The results revealed that environmental education and students' pro-environmental behavior is high. Further, there is a moderate correlation between environmental education and pro-environmental behavior among students. It underscored that students who applied an environmental value tends to be aware of how their behaviour affects the environment. The more the school integrates environmental education, the more it fosters pro-environmental behavior. Therefore, incorporating environmental education into schools enhances students' sustainable actions towards the environment.

**KEY WORDS:** environmental education, pro-environmental behavior, and students, descriptive-correlational design, Philippines

### INTRODUCTION

The environment plays a huge role in all living and non-living creatures fostering and maintaining the lives on this planet. It provides everything that every creature needs, but because of our ignorance, it has become a huge and current worry in this modern world. Numerous recent research have shown that the current environmental problems seriously threaten sustainability and increase the vulnerability of individuals to catastrophes and disasters (Takshe et al., 2023). With these issues, many suggested taking action by starting fundamentally through environmental education. According to the Environmental Protection Agency of the United States (US EPA, 2023), environmental education is a process that enables people to learn about environmental issues, find solutions, and take actions to safeguard the environment, but the question is, does environmental education influence students' pro-environmental behavior?

Research has consistently revealed troubling discrepancies between people's attitudes toward the environment and their actual pro-environmental behavior. This disconnect can be attributed to a multitude of factors that contribute to this disruption. Among these factors are significant deficits in knowledge, motivation, and competing priorities that prevent individuals from aligning their beliefs with actions (Tofighi et al., 2020). In the study conducted by Mamani et al. (2020), cited in Araoz et al. (2023), Peruvian students enrolled in regular basic education demonstrated behaviors of ignorance toward the environment and its conservation. This translated into a lack of interest in promoting the preservation of natural and environmental resources, as well as the promotion of sustainable use of them and the reduction of environmental pollution. The previously described finding is consistent with their findings. Similarly, researchers in Peru also found that students' pro-environmental behavior fell into the medium range, meaning that they occasionally took part in activities that supported environmental preservation and care (Olivera et al. 2021).

On the other hand, several studies have examined the relationship between environmental education and pro-environmental behavior in school pupils. The teaching of environmental education in Mexico was found to have a direct and significant relationship with students' pro-environmental skills, suggesting that good environmental education is linked to good practices in water management, waste disposal, and energy conservation (Diaz et al., 2019). Environmental policies implemented in educational institutions were found to be associated with secondary school students' pro-environmental attitudes and behavior in Hungary (Mónus, 2022). Furthermore, Hoffman et al.'s study from 2020 on the relationship between education and pro-environmental behaviors in the Philippines discovered that a further year of education considerably enhanced the likelihood of engaging in pro-environmental behavior. Last but not least, a cross-sectional study of students in continuing basic education discovered that environmental education promotes protective behavior toward the environment by developing attitudes, values, knowledge, dispositions, and skills (Araoz et al., 2023).

The behavioral change model states that knowledge is linked to attitudes and attitudes to behavior. The behavioral change model, although simple, provides a foundation for considering the probable relationships that exist between environmental knowledge, environmental awareness, and attitude, and how these can translate into action or inaction (Boudreau, 2010). In addition, Hines et al. (as cited in Akintude and Elijah, 2017), state that the responsible environmental behavior model supports the behavioral change model and emphasizes environmental behavior as influenced by situational factors and behavioral intentions, which are closely related to cognitive factors represented by knowledge and personal factors, are expressed by attitudes.

In this research, the independent variable is environmental education, which is indicated by cognitive, affective, and behavioral. Conversely, the dependent variable is pro-environmental behavior.

Environmental education has three dimensions, according to a theoretical proposal by Santacruz (2018): cognitive, emotional, and behavioral aspects. The educational aspect looks at the extent to which teachers inform and educate pupils about issues relating to environmental problems that are likely to affect society in the future. On an emotional level, it is related to pupils' feelings of worry, respect, and awareness of environmental issues. On the behavioral side, it refers to the willingness of students to act sustainably and to promote solutions to environmental problems in their environment that can be effectively implemented through environmental protection activities.

According to Kollmus and Akintude (2002), as cited in Tian and Liu (2022), pro-environmental behavior is a practice of limiting the adverse effects of one's activity on the environment, emphasizing the independence of individuals, and reducing the harm brought to the world.

The majority of the research that has been done so far does not address the possibility that education may be endogenous, despite the abundance of evidence linking education to pro-environmental behaviors such as consumption, conservation, and lifestyle (Wang et al., 2022). Since there is no study conducted here in Island Garden City of Samal, particularly in UM Peñaplata College about the correlation between environmental education and the pro-environmental education of students. The researchers are motivated to address the gap and to provide answers to these questions that can be used as a contribution to solving environmental issues and environmental sustainability.

The purpose of this study is to determine the relationship between environmental education and pro-environmental behavior among UM Peñaplata College Students. The study seeks to answer the following questions:

1. What is the level of environmental education of UM Peñaplata College students in terms of:
  - 1.1 cognitive,
  - 1.2 affective,
  - 1.3 behavior?
2. What is the level of pro-environmental behavior of UM Peñaplata College students?
3. Is there a significant relationship between environmental education and pro-environmental behavior among UM Peñaplata College students?
4. Which domain of environmental education can best influence pro-environmental behavior?

This research may provide significant information on the implementation of environmental education in educational institutions, the evolution of students' pro-environmental behavior, and the relationship between the two variables, globally. Moreover, it will enable an objective diagnosis that will be used to implement curriculum changes, teaching-learning strategies, and improvement strategies that will provide a more thorough environmental education that articulates theoretical and practical aspects for addressing the causes of environmental problems which will be a great benefit for the curriculum developers/ planners. For students, this study will help them to increase their level of education about the environment and raise awareness about the different environmental issues. For the teachers, this study will help them to promote pro-environmental behavior among their students. Lastly, this study will benefit future researchers because this study will provide valuable information that they can use in their study related to environmental education and pro-environmental behavior.

## **METHODS**

This chapter explains the methods employed in this study, such as research respondents, research material and instrument, research design and procedure, and ethical considerations.

**Research Respondent.** The respondents of this study were the students of UM Peñaplata College. The UM Peñaplata College is one of the accredited college universities by CHED in Island Garden City of Samal. The researchers used a stratified random sampling. Stratified random sampling is a sampling method that divides a population into smaller subgroups known as strata. Strata are produced in stratified random sampling, or stratification, depending on members' shared qualities or features, such as income or educational attainment. In choosing the respondents of this study the inclusion criteria were considered: bonafide students of UM Peñaplata College from first year to fourth year in the academic year 2023-2024 regardless of their program. In the context of this study, the respondents consisted of 244 respondents: 39 from the first year, 53 from the second year, 99 from the third year, and 53 from the fourth year. Therefore, this study includes the Teacher Education, and Business Administration program at UMPC.

**Environmental Education and Pro-Environmental Behavior Among Um Peñaplata College Students. Vol. 01 Issue 04-2024 Materials and Instrument.** The instrument of this study adapted a validated questionnaire to determine the relationship between environmental education and pro-environmental education among UM Peñaplata College students. Environmental education by Cueto (2017) was translated from Spanish to English and pro-environmental behavior by Zainuri et al. (2022) was developed in the study's questionnaire. The questionnaire consisted of 20 items for environmental education and 20 items for pro-environmental behavior, with a total of 40 items. To ensure the accuracy of the information and the dependability of the subsequent conclusions, the questionnaires are carefully constructed.

The following matrices were used to investigate the relationship between environmental education and pro-environmental education.

A range of 4.20 - 5.00 strongly agrees with a scale of 5, which means that the students are extremely aware and concerned about the environment. A range of 3.40 - 4.19 agrees with a scale of 4, which means that the students are moderately aware of environmental education. A range of 2.60 - 3.39 slightly agrees with a scale of 3, which means that the students are somewhat aware of environmental education. A range of 1.80 - 2.59 disagrees with a scale of 2, which means that the students are not aware the environmental education. A range of 1.00 - 1.79 strongly disagrees with a scale of 1, which means that the students are extremely not aware of environmental education.

**Analysis and Interpretation of Level on Environmental Education**

Range of Means	Description	Interpretation
4.20 - 5.00	Very High	It means that the students' environmental education is always observed.
3.40- 4.19	High	It means that the students' environmental education is often observed.
2.60 - 3.39	Moderate	It means that the students' environmental education is sometimes observed.
1.80 - 2.59	Low	It means that the students' environmental education is rarely observed.
1.00 - 1.79	Very Low	It means that the students' environmental education is never observed.

**Analysis and Interpretation of Levels on Pro-Environmental Education**

Range of Means	Description	Interpretation
4.20 – 5.00	Very High	It means that the students' pro-environmental education is always observed.
3.40 – 4.19	High	It means that the students' pro-environmental behavior is often observed.
2.60 – 3.39	Moderate	It means that the students' pro-environmental behavior is sometimes observed.
1.80 – 2.59	Low	It means that pro-environmental behavior is rarely observed.
1.00 – 1.79	Very Low	It means that the students' pro-environmental behavior is never observed.

**Design and Procedure.** This study used a quantitative approach, particularly descriptive correlational, where researchers defined and statistically calculate the level of relationship between environmental education and pro-environmental behavior among UM Peñaplata College students. The descriptive method involves examining people, things, or situations to describe their characteristics. Researchers describe the sample or variables; they do not modify them. Descriptive studies analyse the attributes of a group of individuals and identify potential issues within this group (Siedlecki, 2020).

In this context, the researchers submitted a letter of authorization to the School Director, and Dean of College. Researchers performed the survey as soon as they receive authorization. The researchers explained a few terms to the respondents so that they may answer the questionnaires honestly. The researchers demand complete honesty from the respondents. A face-to-face survey was conducted by the researchers. Once the respondents had finished the questionnaire, the researchers collected and tallied the essential statistical data. The researchers created a conclusion and recommendations for this study based on the data.

The researchers followed procedures when dealing with the data. The gathered data are tabulated, processed, and evaluated using the mean to quantify the level of environmental education and pro-environmental behavior of UM Peñaplata College. Thus, Pearson Product Moment Correlational was used to determine the relationship between students' environmental education and the pro-environmental behavior of UM Peñaplata College.

**Ethical Considerations.** Before data collection, this investigation addresses ethical considerations and inquiries. The panel members function as an ethics review committee and evaluated the researchers' ethical practices.

*Voluntary Participation.* To safeguard the privacy of the respondents, their involvement in the research is both optional and confidential. If respondents have inquiries about their participation in the study, they are provided with relevant information.

*Privacy and Confidentiality.* In compliance with applicable laws, the study's records are maintained confidentially. Any personally identifiable information gathered during the study is kept private unless it is deemed necessary to safeguard the well-being or rights of the respondents. Researchers have the choice of not disclosing respondents' details to individuals unrelated to the study. When presenting the study's findings at conferences or publishing them, no personal information is disclosed. Consequently, this study adhered to the Data Privacy Act of 2012, which aims to prevent the unauthorized handling of individuals' private data and assure them that their responses cannot be traced back to them. Moreover, respondents' names are never disclosed, and only the

researchers have access to specific responses provided by participants. To protect the rights of the participants, all data collected for this study is treated as confidential and kept secure.

*Recruitment.* By this ethical guideline, the entities responsible for recruitment, with a particular focus on the researchers, address any potential discomfort that survey respondents might encounter. They do so by carefully evaluating the appropriateness of their roles as recruiters and by assessing the extent of potential risks and the corresponding measures for alleviating these risks, which encompassed physical, psychological, social, and economic aspects.

*Risks.* This study do not involve any high-risk situations, including challenges related to socioeconomic status, mental well-being, or physical health that the respondents could potentially encounter. The rights of the study respondents are safeguarded and respected.

*Benefits.* The researchers could also disseminate the general findings about the statistical results of students' mental health during remote learning to future researchers, especially the audience. People can gain insights from the study's findings as they offer fresh data about the study's numerical aspects.

*Safety.* Additionally, pseudonyms are employed throughout the research to protect the anonymity of the respondents, ensuring their safety. Moreover, the survey data is treated as confidential and solely used to support the research conclusions.

*Plagiarism.* To prevent plagiarism, the researchers utilize Turnitin software to ensure that no content from other sources is presented as their own. They diligently adhered to the appropriate referencing style, incorporating ideas from other authors and experts. The research underwent thorough scrutiny for grammatical errors and plagiarism, utilizing Turnitin and Grammarly tools. Given that this study draws upon a multitude of previous research, the researchers took great care to avoid any misrepresentation of their work as original, making sure that all content is clearly explained and properly cited. All sources used in this investigation are reputable journals or scholarly works, and no manipulation or alteration of acquired data occurred as the study adhered to the APA 7th edition citation style guidelines.

*Fabrication.* The collected facts and information have been recorded with utmost precision, ensuring that there is no manipulation of data or deliberate promotion of inaccurate conclusions. The information presented in the manuscript is consistent with what has been previously published in other works, and there are no discrepancies.

*Falsification.* Likewise, the possibility of falsification is considered, but there is no indication that the research is intentionally manipulated to fit a specific model or theoretical assumption. There is no evidence of exaggeration or making unreasonable claims.

*Conflict of interest.* A conflict of interest arises because the researchers are students at UM Peñaplata College. To address this conflict, the researchers took deliberate steps to prevent it by refraining from surveying their fellow students and classmates. Their professional judgment regarding key aspects like the well-being of the respondents and the credibility of the study is unlikely to be swayed by secondary interests such as financial gain, academic advantages, or recognition.

*Deceit.* Throughout this study, no form of dishonesty was employed to harm the well-being of the respondents. All information presented in the study underwent rigorous assessment and validation by a panel of experts. Additionally, the study emphasizes that honesty is more beneficial than detrimental to the well-being of the respondents.

*Permission from Organization / Location.* The researchers ensure that the schools provided their permission. The researchers indicated seeking formal permission from the institution or site where the research would be conducted or data would be collected. In addition, by providing a clear and understandable survey questionnaire, the researchers ensure that the respondents are fully aware of the benefits the school may obtain from the study through informed consent. As a result, the survey is conducted with the consent and agreement of the respondents.

*Authorship.* The study takes into account the criteria for authorship. Under the guidance and oversight of the research advisor, the researchers actively contributed to the conception, design, data collection, statistical analysis, and data interpretation. The researchers and advisor work together on the paper, engaging in thorough editing to ensure its intellectual integrity. Both play significant roles in the research process, culminating in the publication of the study.

## **RESULTS AND DISCUSSION**

The results and a discussion of the conclusions are shown in this section. The data were evaluated using statistical tools based on its meaning. The presentation includes an explanation and analysis of the tables that shed light on the significance of the data. For each topic, an analysis and an implication are given.

### **Level of Environmental Education**

The UM Peñaplata College students' statistics on their level of environmental education are shown in Table 1. Three indicators make up environmental education: cognitive, affective, behavioral. The overall mean score for environmental education among UM Peñaplata College students is 4.79 with a standard deviation of 0.25, indicating that their environmental education is consistently observed or manifested at a very high level. Students are also aware that the institution creates initiatives to support environmental preservation and conservation. As a result, they believe recycling contributes to environmental improvement.

Table 1 shows that, of all these variables, the affective indicator had the highest mean ( $M=4.85$ ,  $SD=.25$ ), followed by the cognitive indicator ( $M=4.79$ ,  $SD=.28$ ) which had the second-highest mean. The behavioral indicator had the lowest mean score ( $M=4.74$ ,  $SD=.34$ ). Each of these indicators, with a very high descriptive level, shows that every domain was consistently observed. This suggest that the students are contributing to environmental preservation and conservation.

**Table 1. Level of Environmental Education**

Statements	SD	M	Descriptive Level
Cognitive	.28	4.79	Very High
Affective	.25	4.85	Very High
Behavioral	.34	4.74	Very High
<b>Overall Mean</b>	.25	4.79	<b>Very High</b>

*Note: N = 244, M = Mean, SD = Standard Deviation*

It was found from the study that environmental education is evident. It was observed in cognitive, affective, and behavioral. It also has a very high-level description. This result correlates with the study of Wen et al. (2016, as cited in Wang et al., 2022) people with a higher level of formal education have access to more sources and types of information and an increased exposure to information further increases peoples’ environmental knowledge and environmental awareness.

**Level of Pro-Environmental Behavior**

The Pro-Environmental Behavior is displayed in Table 2. The overall mean ( $M=4.65$ ,  $SD=.37$ ) of students’ pro-environmental behaviour was described as very high or always observed. This means that the students of UMPC support or involve in a campaign related to environmental conservation efforts and tend to buy products that do not harm the environment.

**Table 2. Level of Pro-Environmental Behavior**

Statements	SD	M	Descriptive Level
<b>Overall Mean</b>	.37	4.65	<b>Very High</b>

*Note: N = 244, M = Mean, SD = Standard Deviation*

In appendix J, Table 2, statement number 20 got the highest mean score of 5.00. However, statements “*I will drive less and use other models of transportation*” and “*I will reduce the frequency of charging phone to reduce electricity consumption*” both received the lowest mean scores ( $M=4.50$ ,  $S=.62$ ) ( $M=4.50$ ,  $S=.59$ ), respectively. This suggest that students are supportive or engaged in campaign related to environmental conservation efforts. However, it was found that students’ actions such as reducing driving and utilizing alternative modes of transportation, as well as decreasing the frequency of charging their phones to conserve, are not highly observable.

Conversely, the study of Stern (2000, as cited in White et al., 2019), shows a high description of pro-environmental behavior and states that persons who practice pro-environmental behavior do so because they believe in the critical nature of environmental issues and understand how they would affect not just themselves but also other people and the environment as a whole. Moreover, the result of the study revealed a very high level of pro-environmental behavior. This may infer that the students were practicing actions that preserve the environment.

**Significant Relationship between Environmental Education and Pro-Environmental Behavior**

The correlation between environmental education and pro-environmental behavior was investigated by the correlation analysis shown in Table 3. A confidence level of  $p<.05$  was applied in this investigation, and the results show a substantial correlation between the two variables.

For each of these factors, the overall p-value was .001 and has an r-value of .686. As a result, the researchers discovered a strong correlation between environmental education and pro-environmental behavior among students. Conversely, it is indicated that pro-environmental behavior has a major role in order to be educated and aware in our environment like reusing papers for making notes or printing, shortening the shower time utilizing biodegradable trash plastic at home and school.

**Table 3. Significant Relationship between Environmental Education and Pro-Environmental Behavior**

Environmental Education	Pro-Environmental Behavior
	Overall
<i>Cognitive</i>	.599* ( $<.001$ )
<i>Affective</i>	.528* ( $<.001$ )

Behavioral	.590*
	(<.001)
<b>Overall</b>	<b>.686*</b>
	<b>(&lt;.001)</b>

\*p<.05 – Significant

In addition, the study found a significant relationship between environmental education and pro-environmental behavior. Jin (2023, as cited in Wu et al., 2023) discovered that a high level of environmental education can significantly raise people's motivation, ability, and reasons to engage in pro-environmental behaviors. That supports the idea that there is a correlation between environmental education and pro-environmental behavior.

In addition, Mkumbachi (2020), stated that an individual who applies a strong environmental value tends to be aware of how his/her behavior affects the environment. Conversely, this study confirmed the behavioral change model by Boudreau (2010), where knowledge is linked to attitudes and attitudes to behavior. This is to justify that environmental awareness leads to pro-environmental behavior.

**Regression Analysis of the Influence of Environmental Education on Pro-Environmental Behavior**

Presented in table 4 in the regression analysis that revealed which indicator of environmental education best influence pro-environmental behavior. The data in Table 4 shows a significant influence of environmental education over pro-environmental behavior. The obtained F-value of 72.635 is significant at p<0.05 which indicates a model fit. Also, the R-squared value of .469 or 46.9% suggested that F the variance in pro-environmental behavior was attributed to the indicators of environmental education specified in the study.

Additionally, Table 4 revealed the regression analysis of the study which shows that the best indicator is influenced by Pro-environmental behavior in behavioral which suggests that it has a stronger positive influence on behavior. The behavioral coefficient value of .381, estimated t-value of 6.339, and p-value of 0.05 indicated that the study was significant. As a result, it may be inferred that the behavioral indicator has a significant influence on pro-environmental behavior.

**Table 4. Regression Analysis of the Influence of Environmental Education on Pro-Environmental Behavior**

Environmental Education	Pro-Environmental Behavior		
	$\beta$	t	Sig.
Constant	-.117	-.339	.735
Cognitive	.411	4.824	<.001*
Affective	.205	2.221	.027*
Behavioral	.381	6.339	<.001*
	<i>R</i>	.690	
	<i>R</i> <sup>2</sup>	.469	
	F	72.635	
	p	<.001*	

\*p<.05 – Significant

In Table 4, in the regression analysis, the behavioral indicator was found to be the most influential factor in promoting pro-environmental behavior among UM Peñaplata College students. This suggests that the actions and habits that the students exhibit have a significant impact on their overall environmental consciousness. The remaining indicators, cognitive and affective, may have the lower influence due to unconsidered factors or external variables not accounted for in the study.

Conversely, the results show that the behavioral indicator from environmental education variable revealed a high statistical influence on students' pro-environmental behavior. This finding is consistent with the study by Teixeira et.al. (2022), which explores various factors influencing pro-environmental behavior, including habits, perceived behavioral control, and values. Their study identifies this aspects of the behavioral domain as crucial in understanding and promoting environmentally friendly actions, emphasizing the importance of ingraining sustainable habits and values to foster a more environmentally conscious community.

**CONCLUSION**

The researchers drew the following conclusions using the study's significant findings. The environmental education at UM Peñaplata College is very high in cognitive, affective, and behavioral domains based on the findings. This indicates that their

environmental education is consistently observed or manifested at a very high level. This means that students are aware that the institution creates initiatives to support environmental preservation and conservation.

For the level of students' pro-environmental behavior of the 244 students from 1<sup>st</sup> year to 4<sup>th</sup> year, the respondents were always observed in making actions that contribute sustainably to the environment. Thus, students of UMPC support or involve in a campaign related to environmental conservation efforts and tend to buy products that do not harm the environment. This means that the students were practicing actions that developed pro-environmental behavior.

In addition, the findings of this study demonstrate a significant relationship between environmental education and pro-environmental behavior. The more the school implements environmental education, the more the students act sustainably for the environment. Thus, integrating environmental education into schools enhances the awareness of the students of environmental issues. Furthermore, it can be concluded that the school heads and teachers are knowledgeable and skilled enough to develop students' pro-environmental behavior.

Moreover, the data revealed that behavioral indicator has the highest level of description. This means that the behavioral domain in learning best influences pro-environmental behavior. Therefore, it was concluded that the school's implementation of environmental education was best observed on the behavior of the students, which suggests that the actions and habits that the students exhibit have a significant impact on their overall environmental consciousness.

## RECOMMENDATIONS

The following recommendations are offered based on the findings and conclusions aforementioned:

Since environmental education and pro-environmental behavior are always observed, UM Peñaplata College may maintain the foreground of learning for students to maintain their behavior towards the environment. Teachers may maintain the effectiveness of their teaching strategies in teaching environmental education to develop environmental literacy in their students. Moreover, students may maintain the effectiveness of their behavior acting more sustainably for the environment.

Additionally, it shows that the affective indicator has the lowest data, indicating that students may improve their inclination and take ownership of their learning. One strategy that teachers can use to develop students' affective domain is by establishing classroom procedures that support affective objectives and provide opportunities for them to develop as independent thinkers and self-reliant problem solvers.

Future researchers are encouraged to conduct this kind of research at the basic education level using different research materials and instrument to expand this kind of study and to identify if the relationship of the two variables can be affected by different level of education among the students.

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## DEDICATION

As the ultimate source of knowledge and direction, we humbly dedicated our thesis to Almighty God, recognizing your boundless grace and providence during our journey.

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