Factors Shaping Environmentally Responsible Behavior: A Study on Junior High Students

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Abstract

The Philippines is one of the countries that will be affected by severe weather conditions due to its location facing the Pacific Ocean, where the Typhoon originates. The study Examining the Factors Influencing Environmentally Responsible Behavior among Junior High Students will explore the respondent demographic, education, and environmental factors affecting environmentally responsible behavior in Junior High students. The research investigates the relationship between science academic performance and factors such as sex, school type, curriculum, and residence location, assessing their impact on environmentally responsible behavior development.The study uses a quantitative research design, collecting data from 400Junior High students in purposive sampling through surveys and academic performance analysis. Findings show students display moderate environmentally responsible behavior, with factors like sex, curriculum, school type, and residence location significantly impacting science performance and environmentally responsible actions.In the Philippines context, the study emphasizes the K to 12 curriculum's effectiveness in promoting science performance and environmentally responsible behavior among Filipino students. It highlights the importance of addressing science education disparities based on school type, residence location, and the need for targeted support and resource allocation.The findings offer valuable insights for educators, policymakers, and stakeholders to design and implement targeted interventions fostering environmental awareness, academic achievement, and environmentally responsible behavior in Junior High students, ultimately promoting environmental sustainability and responsible actions.

Keywords: environmentally responsible behavior, Junior High School students, academic performance, science education, K to 12 curricula, environmental education, demographic factors, Philippines

1. Introduction

As a country in the Pacific Ocean, the Philippines is at the frontline of climate change, frequently experiencing devastating typhoons and extreme weather events. Climate change mitigation efforts are paramount, and one practical approach is fostering environmentally responsible behavior amongst the younger generation. By instilling in students the knowledge and actions needed to respond to climate change, we can cultivate a "Green Generation" that respects and protects the environment, ultimately contributing to the resilience and sustainability of our communities.

The study entitled "The Green Generation: Examining the Factors Influencing Environmentally Responsible Behavior among Junior High Students" aims to explore the complex interplay between various demographic factors and environmentally responsible behavior in the context of science education. Drawing from research conducted between 2015 and 2022 (Wang & Degol, 2017; Bybee, 2015; Lubienski et al., 2016; Sirin, 2016; Castro et al., 2019), the study investigates the impact of factors such as sex, curriculum, school type, and residence location on students' academic performance in science and their engagement in environmentally responsible behaviors.

The research findings reveal moderate environmentally responsible behavior among respondents, underscoring the importance of fostering environmental awareness, understanding, and problem-solving abilities among Junior High students. Furthermore, the study highlights the role of demographic factors in shaping students' academic performance in science, pointing to the need for targeted interventions and strategies that promote academic success and environmental stewardship.

Integrating the findings from various studies will contribute to the existing knowledge of the factors that influence environmentally responsible behavior and academic performance in science education. The study emphasizes the importance of creating inclusive learning environments, adapting the curriculum to promote a deeper understanding of scientific concepts, and addressing disparities based on school type and residence location to ensure equal opportunities for all students (Bybee, 2015; Lubienski et al., 2016; Sirin, 2016).

In the context of the Philippines, the study highlights the need to tailor educational strategies to the unique challenges and opportunities presented by the country's diverse demographic landscape. The introduction of the K to 12 curricula by the Department of Education, which aims to enhance students' competencies in science and other subjects, exemplifies a targeted approach to addressing the specific needs of Filipino students (Castro et al., 2019).

Finally, the study will provide a comprehensive interpretation of the demographic factors that influence academic performance in science and environmentally responsible behavior among Junior High students. By acknowledging these factors and developing targeted strategies and interventions, educators and policymakers can create a more equitable and inclusive educational environment, ultimately promoting science learning, achievement, and environmentally responsible behavior for all students.

Thus, this study focuses on understanding the factors that influence environmentally responsible behavior among Junior High School students in the Philippines is necessary to provide insights that can guide educational strategies and policy decisions to mitigate the effect of climate change.

2. Literature Review

This section will review literature that discusses the significant research and scholarly contributions that provide a basis for this study. The literature reviewed covers a broad spectrum of related topics, including the importance of environmental education, the influence of demographic and educational factors on environmental behavior, and the context of environmental education in the Philippines. This overview provides the necessary theoretical and empirical background to understand the complexities of cultivating environmentally responsible behavior among junior high students. It contextualizes our research within the broader academic discourse.

Multiple studies suggest that education significantly promotes environmentally responsible behavior among students (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002). Research shows that environmental education can influence students' attitudes toward the environment, increasing their engagement in environmentally responsible actions (Otieno, 2016).

While demographic factors such as sex, school type, curriculum, and residence location have been found to impact students' academic performance and environmentally responsible behavior, sex differences have been reported in environmental attitudes and behaviors (Zelezny, Chua, & Aldrich, 2000). Similarly, students' residential location can impact their access to environmental education and resources, potentially influencing their environmental behavior (Sirin, 2016).

Moreover, studies suggest a link between academic performance, particularly in science, and environmentally responsible behavior (Hong & Huang, 2016). The type of curriculum students are enrolled in can impact their scientific understanding, which in turn influences their environmental attitudes and behaviors (Bybee, 2015).

Whereas in the Philippines, an archipelago frequently affected by climate change impacts such as typhoons, it emphasizes the importance of environmentally responsible behavior in its educational curriculum (Tayko et al., 2016). Research suggests that the K to 12 curriculum in the Philippines can enhance students' competencies in science, thereby promoting environmentally responsible behavior (Castro et al., 2019).

Furthermore, school type can influence academic outcomes and environmental consciousness. Lubienski et al. (2008) found significant differences in the environmental attitudes and behaviors between students from public and private schools.The research underscores the importance of targeted interventions and strategies to foster environmental awareness and responsible behavior among students (Aguilar et al., 2019; Duerden & Witt, 2010).

To further clarify the terms used in this study, the following were defined: Environmentally Responsible Behavior (ERB) refers to actions and behaviors that individuals engage in that reduce harm and promote the sustainability of the natural environment. These behaviors can

include a wide range of actions, from recycling and conserving energy to advocating for environmental policies and participating in environmental education programs.
Kollmuss and Agyeman (2002) provide a widely accepted definition of environmentally responsible behavior as "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world". This definition underscores the intentionality and consciousness behind these actions, suggesting that environmentally responsible behavior goes beyond mere actions and includes an awareness and understanding of the environmental impact of one's behavior.In the educational context, ERB is often promoted as a critical goal of environmental education programs. The idea is to teach students about environmental science and issues and instill in them the attitudes, skills, and behaviors necessary to act in environmentally responsible ways (NAAEE, 2010).

According to Lee, T. H., Jan, F., & Yang, C. (2013) Educational action can be understood as an individual's engagement in activities that foster learning and awareness about environmental issues. This can involve reading relevant literature, viewing environmentally-focused programs, or participating in formal academic coursework. While, financial action, on the other hand, pertains to behaviors that financially support or boycott, based on environmental considerations. These actions might include choosing to buy or avoid certain products due to their environmental impact, making donations to environmental organizations, or supporting environmentally conscious businesses and initiatives (Lee, T. H., Jan, F., & Yang, C., 2013). Furthermore, physical action encompasses activities that directly benefit the environment and do not require monetary involvement. Examples of these behaviors include engaging in litter collection, contributing to community-oriented environmental projects, planting trees, recycling, and participating in other practices that support environmental sustainability (Lee, T. H., Jan, F., & Yang, C. , 2013).

In closing,environmental education has been shown to play a crucial role in fostering environmentally responsible behavior among students. Developing environmental awareness, knowledge, and problem-solving skills can help students make informed decisions and engage in actions that contribute to environmental sustainability. Research has demonstrated that environmental education can positively change student attitudes, values, and behaviors related to environmental issues (Kollmuss & Agyeman, 2002; Chawla & Cushing, 2007).

2. Objectives of the Study

1. To ascertain the level of Environmentally Responsible Behavior in terms of:
    - 1.1. Educational Action
    - 1.2. Financial Action
    - 1.3. Physical Action; and
    - 1.4. Persuasive Action
2. To investigate the relationship between Environmentally Responsible Behavior and demographic factors (such as sex, school curriculum, school type, and residence location) among Junior High students.
3. To examine correlation between the level of environmentally responsible behavior and academic achievement in science.

4. To explore the influence of environmental education on the development of environmentally responsible behavior among Junior High students.
5. To provide valuable insights and recommendations for educators, policymakers, and stakeholders on how to design and implement effective strategies and interventions to foster environmental awareness, academic achievement, and environmentally responsible behavior among Junior High students.

3. The Paradigm of the Study

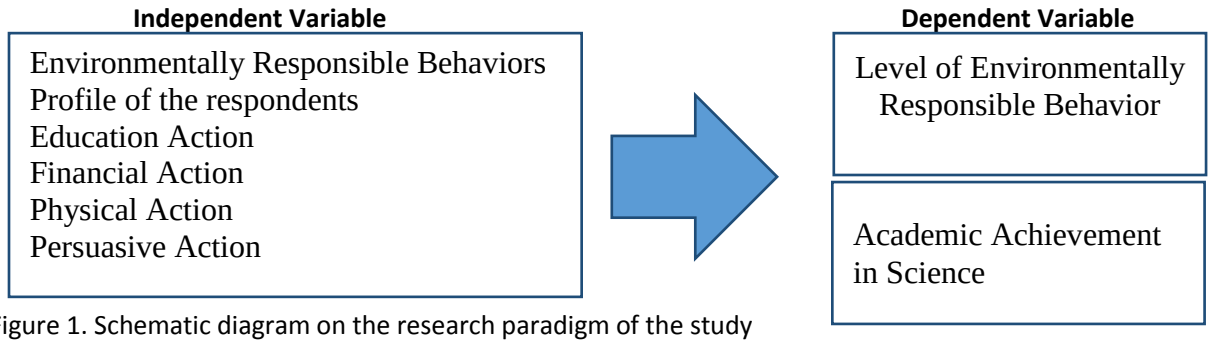

Figure 1. Schematic diagram on the research paradigm of the study

The research paradigm for this study serves as the guiding blueprint, visually representing the interplay of the variables in question. The independent variables or the factors hypothesized to influence the outcomes, are encapsulated by Environmentally Responsible Behaviors, including Education Action, Financial Action, Physical Action, and Persuasive Action (Lee, T. H., Jan, F., & Yang, C. , 2013), as well as the Profile of the Respondents.

The dependent variables, those outcomes we aim to predict or explain, is the Level of Environmentally Responsible Behavior and Academic Achievement in Science. Thus, the research statement of this study can be articulated as follows:

"This study aims to examine how Environmentally Responsible Behaviors and the demographic and personal characteristics (Profile of the Respondents) influence the Level of Environmentally Responsible Behavior and Academic Achievement in Science among Junior High students. By measuring and analyzing these variables, the research intends to uncover the nature and strength of these relationships. This understanding will provide valuable insights to inform educational strategies and policies, promoting environmentally responsible behaviors, and enhancing science education outcomes."

4. Methodology

The methodology used in this study, particularly on the Environmentally Responsible Behavior of Junior Highschool Students, employs an efficient measure of the respondents' environmentally responsible behaviors. The methods encompass four key behavioral domains as previously mention. Each of this sphere captures unique aspects of students' environmental responsibility and participation.

This section includes the research design, study participants, research instrument, data gathering procedure, and data analysis. The paper ensures the validity and reliability of research findings, which can help inform environmental education policies and practices.This particular procedure strengthens the credibility of our research, offering valuable insights that can be leveraged to inform policies and practices in environmental education. Furthermore, our methodological approach provides a solid foundation for future studies investigating environmentally responsible behavior among students.

4.1. Research Design

The studyutilizes a systematic and rigorous framework to provide a comprehensive data collection and analysis framework. It details the study's participants, carefully describing their demographic attributes to ensure our findings' relevance and applicability. Thus, this study will use a quantitative research design and a descriptive-correlational design to assess the level of environmentally responsible behavior among Junior High School students in the Philippines.

4.2. Participants of the Study

A sample of 400 students from selected Junior High schools in Iloilo City and Iloilo Province, Philippines, will be the subject of the study. These students from identified schools will be selected using a stratified random sampling technique.

4.3. Research Instrument

The research instrument questionnaire was adopted from the paper of (Lee, T. H., Jan, F., & Yang, C. , 2013)with four vital behavioral domains: educational action, financial action, physical action, and persuasive action. The questionnaire has been revised to consider the localized context of the Philippines and contains multiple choice questions to be resolved using Likert scales. It is planned to be completed within 60 minutes. It was tested for validity and reliability to ensure the accuracy of the data collected.It also adheres to established ethical and academic standards, ensuring the integrity of the research process.

4.4. Data Gathering Procedure

The procedural process was carefully followed, such that authority from the school principals was secured to ensure the smooth administration of the questionnaire. Following the protocol, the principal designated section advisers and determined the date and time to hand out the questionnaire. The section advisers returned the completed questionnaires to the researcher, and the investigator processed the data as required by the study.

4.5. Data Analysis

The data analysis as the core scientific evidence was conducted is both rigorous and nuanced, allowing investigators to discern meaningful patterns and relationships within the data. The researcher employs appropriate statistical methods to interpret our findings, ensuring that they are both robust and reliable. Specifically, the Data input will be done using Microsoft Excel, and data processing will be conducted using SPSS (Statistical Package for the Social Sciences). Descriptive statistics and inferential statistics, including Chi-squared and Pearson's R, will be

used to examine differences in environmentally responsible behavior among respondents from different Junior high schools.

5. Results and Discussion

Table 1 presents the demographic profile of the 400 respondents in this study. Most respondents were female, comprising 57.3% (n=229) of the total sample, while males accounted for 42.8% (n=171).Regarding curriculum type, most respondents were enrolled in regular classes (85.8%, n=343), while 14.3% (n=57) were in special science classes. The result suggests that a smaller proportion of the respondents were engaged in specialized science academic tracks.

Regarding school type, most respondents attended public high schools (63.5%, n=259). Students from State Universities and Colleges (SUC) Laboratory schools constituted 19.6% (n=80), and those from private high schools represented 15.0% (n=61) of the sample. The result implies that the data primarily captures the experiences of public school students.Finally, for residence location, a higher proportion of respondents lived in urban areas (59.1%, n=241) than those in rural areas (39.0%, n=159). The data indicates a fair representation of students from various residential backgrounds in the sample.

The data from Table 1 will be helpful in the subsequent analysis to understand how these demographic factors might influence academic performance and environmentally responsible behavior among Junior High students. Moreover, the gender distribution in Table 1 aligns with trends in educational engagement, where females often outnumber males (Sax, 2016). Gender dynamics in the sample may influence the results given the reported sex differences in environmental attitudes and behaviors (Zelezny et al., 2000). Furthermore, the predominance of regular curriculum students over special science class students is a natural situation in the Philippines due to the limited number of teachers with master's degrees or with units in a graduate school specializing in science and mathematics.

However, curriculum type can impact science achievement and environmental attitudes (Bybee, 2015), making this factor essential in the study. In contrast, the higher representation of public high school students could imply broader insights into this demographic. Previous studies suggest that school type can influence academic outcomes and environmental consciousness (Lubienski et al., 2008).Finally, the urban predominance might reflect the global trend of increasing urbanization. Residence location can impact access to environmental education and resources, potentially influencing environmental behavior (Sirin, 2016).

Finally, the demographic distribution presented in Table 1 provides a valuable basis for examining the various factors influencing Junior High students' academic performance and environmentally responsible behavior. The data reflects a diverse sample of students from different curricula, school types, and residential backgrounds, allowing for a comprehensive analysis of how these factors interact and impact student outcomes. The predominance of female students, regular curriculum participants, public high school attendees, and urban dwellers may have implications for the study's findings and their applicability in different contexts. The data underscores the importance of considering demographic variables when designing educational strategies and interventions to promote academic achievement and environmentally responsible behavior.

Table 1
Profile of the respondents

	Profiles	Frequency, n =400	Percentage
Sex	Female	229	57.3%
	Male	171	42.8%
School curriculum	Regular class	343	85.8%
	Special science class	57	14.3%
School type	Public High school	259	63.5%
	SUC Lab School	80	19.6%
	Private High school	61	15.0%
Residence location	Urban	241	59.1%
	Rural	159	39.0%

Table 2 examines respondents' environmentally responsible behavior across four domains. The overall mean score of 2.96 and a standard deviation of 0.61 reveal moderate environmentally responsible behavior, indicating growth potential. Monroe et al. (2019) stress the importance of environmental literacy for a sustainable future. Educators should promote acquiring environmental knowledge to enhance responsible behavior.

In the financial action category (Mean=2.92, SD=0.82), Klöckner (2015) highlights the importance of sustainable consumption habits. Educators should emphasize eco-friendly purchasing choices and support environmental organizations. In the physical action category (Mean=2.94, SD=0.65), Wals et al. (2017) underscore the significance of joining in environmental initiatives to cultivate individual responsibility. Educators should advocate for involvement in environmental activities.

In the persuasive action category (Mean=2.97, SD=0.75), Corner et al. (2018) emphasize communication's critical role in fostering environmental consciousness. Educators should inspire students to participate in discussions about environmental challenges and share eco-friendly practices. The grand mean (2.96) with a standard deviation of 0.61 indicates moderate levels of environmentally responsible behavior. Educators should leverage research findings to help students contribute to a more sustainable future.

Moreover, the findings of Erdogan's (2009) study on fifth-grade students in Turkey and a local study by Garcesa and Limjuco (2014) involving Philippine science teachers highlight respondents' ambivalent behavior towards the environment. These similarities suggest shared environmental attitudes across countries. Heyl, Díaz, and Cifuentes (2013) noted that students generally perceive pro-environmental behaviors as beneficial to the environment, emphasizing the need for initiatives encouraging individual participation in environmentally responsible actions.

In conclusion, respondents' moderate environmentally responsible behavior across categories indicates room for improvement. By considering insights from local and international research, educators and policymakers can work together to create more equitable, inclusive, and environmentally conscious educational environments that foster student success and promote a more sustainable future for the country.

Table 2
Environmental Responsible Behavior

Environmentally Responsible Behavior	Mean	SD	Interpretation
1 Education Action	3.04	0.9	Moderate
2 Financial Action	2.92	0.82	Moderate
3 Physical Action	2.94	0.65	Moderate
4 Persuasive Action	2.97	0.75	Moderate
Grand Mean	**2.96**	**0.61**	**Moderate**

Table 3 presents the academic achievement in science of Junior High School students. The distribution of performance levels highlights that most students (66.17%) scored within the fair to good range (80-89). The result aligns with research by Sadler et al. (2017), which emphasizes the importance of enhancing science education to promote students' critical thinking and problem-solving skills. Furthermore, a smaller percentage of students (22.06%) achieved very good to excellent scores (90-99), indicating that there is potential for more students to excel in science with proper guidance and support.

At the lower end of the performance spectrum, 11.76% of students scored poorly (70-79), suggesting that these students may require additional support and resources to improve their understanding of science concepts. Research by Macfadyen et al. (2021) highlights the need to address the learning gaps in science education, particularly among students who struggle to keep up with their peers.

To enhance the overall academic achievement in science among Junior Highschool students, educators can adopt innovative teaching strategies and utilize technology to create more engaging learning experiences, as Slavin et al. (2019) suggested. Furthermore, providing tailored support to students with varying learning needs can help improve their performance in science (Darling-Hammond et al., 2020). By addressing these challenges, educators can ensure that more students reach higher levels of academic achievement in science, ultimately fostering a generation of scientifically literate individuals.

Table 3
Academic Achievement in Science of the Junior High School

Academic Performance in Science	f	%	Description
95-90	12	2.94	Excellent
90-94	78	19.12	Very Good
85-89	128	31.37	Good
80-84	142	34.80	Fair
75-79	38	9.31	Poor
70-74	10	2.45	Very Poor

Table 4 investigates the relationship between the level of environmentally responsible behavior (ERB) and sex across four categories. The chi-squared test results indicate significant differences

in the Financial and Physical action categories, while no significant differences were found in Education and Persuasive action categories.

In the context of Financial Action (χ^2 = 35.206, p-value = 0.013*), the significant relationship implies a difference between male and female respondents regarding their environmentally responsible behavior concerning financial actions. This finding aligns with previous research by Zelezny et al. (2015), who found that gender differences exist in certain environmental behaviors, such as purchasing environmentally friendly products or donating to environmental causes.

Regarding Physical Action (χ^2 = 69.010, p-value = 0.031*), the significant relationship suggests that male and female respondents differ in their direct engagement in activities that promote environmental conservation and protection. This observation is supported by research conducted by Otto et al. (2018), which found that gender differences could be observed in the level of participation in environmental activities.

However, the non-significant relationships for Education Action (χ^2 = 24.202, p-value = 0.283) and Persuasive Action (χ^2 = 34.752, p-value = 0.338) indicate that male and female respondents display similar levels of engagement in environmental education and persuasive actions. These findings align with research by Boldero et al. (2017), who found that gender differences in environmentally responsible behaviors are domain-specific and not universally applicable across all areas of environmental engagement.

These results highlight the need for targeted interventions to address gender differences in specific areas of environmentally responsible behavior, focusing on Financial and Physical actions while maintaining a broader approach to promoting education and persuasion actions among both genders.

Table 4
Level of Environmentally Responsible Behavior and Sex

Indicators	Chi-squared	p-value	Decision on Ho	Interpretation
Education action	24.202	0.283	Do not Reject Ho	Not Significant
Financial action	35.206	**0.013***	**Reject Ho**	**Significant**
Physical action	69.010	**0.031***	**Reject Ho**	**Significant**
Persuasive action	34.752	0.338	Do not Reject Ho	Not Significant

*Significant at 0.05 level of confidence

Table 5 examines the relationship between the level of environmentally responsible behavior (ERB) and the curriculum across four domains. The chi-squared test results indicate a significant difference in the Financial Action category, while no significant differences are found in the Education, Physical, and Persuasive Action categories.

For Financial Action (χ^2 = 37.303, p-value = 0.007**), the significant relationship implies a difference in environmentally responsible behavior concerning financial actions between

students exposed to different curricula. This finding is consistent with Klöckner's (2015) research, which highlighted the importance of promoting sustainable consumption habits through education. The result suggests that curriculum content can impact students' engagement in environmentally friendly purchasing decisions and support environmental organizations financially.

However, the non-significant relationships for Education Action ($\chi^2 = 29.260$, p-value = 0.108), Physical Action ($\chi^2 = 45.861$, p-value = 0.601), and Persuasive Action ($\chi^2 = 34.954$, p-value = 0.329) indicate that the curriculum does not significantly influence students' engagement in these aspects of ERB. These findings align with the research by Boldero et al. (2017), who found that environmental behaviors are often domain-specific, and not all aspects of ERB were influenced by the same factors.

These results suggest that targeted interventions within the curriculum should focus on financial action to enhance environmentally responsible behavior in this domain. At the same time, a comprehensive approach to promoting education, physical, and persuasion actions among students should be maintained, given the non-significant relationships with the curriculum in these areas. Moreover, the findings indicate that the curriculum may contribute to environmentally responsible behavior in only a few aspects, as demonstrated in this study. Furthermore, the results imply that the curriculum correlates predominantly with students' financial actions toward the environment. The result suggests that students may be more inclined to support environmental initiatives financially, emphasizing the importance of incorporating financial action into curricular interventions.

Table 5
Level of Environmental Responsible Behavior and Curriculum

Indicators	Chi-squared	p-value	Decision on Ho	Interpretation
Education action	29.260	0.108	Do not Reject Ho	Not Significant
Financial action	37.303	**0.007****	**Reject Ho**	**Significant**
Physical action	45.861	0.601	Do not Reject Ho	Not Significant
Persuasive action	34.954	0.329	Do not Reject Ho	Not Significant

*Significant at 0.05 level of confidence

Table 6 reveals that environmentally responsible behavior varies significantly between school types only in the financial action category, with a chi-squared value of 62.881 and a p-value of 0.007, significant at a 0.05 level of confidence. This finding aligns with Klöckner's (2015) research, emphasizing the importance of sustainable consumption habits. The relationship between school type and financial action highlights the need for targeted curriculum interventions.

However, no significant differences were found between school types for education action, physical action, and persuasive action categories. This result suggests that a comprehensive approach to promoting these aspects of environmentally responsible behavior should be considered, regardless of school type, as emphasized by Wals et al. (2017) and Corner et al. (2018).

Although no significant differences were found in these categories between school types, moderate levels of environmentally responsible behavior still exist. This observation implies that public and private schools face similar challenges in fostering a stronger sense of environmental responsibility. Schools and educators should collaborate and share best practices for promoting environmentally responsible behavior across all categories, regardless of school type.

Additionally, as school type impacts financial action, schools should provide tailored programs and initiatives targeting this specific aspect of environmentally responsible behavior, such as organizing fundraising events or supporting local environmental organizations.

In summary, while school type may influence students' financial actions towards the environment, it has less impact on other aspects of environmentally responsible behavior. The data highlights the importance of addressing challenges both public and private schools face in fostering environmentally responsible behavior. Future interventions and research should consider school-specific factors and broader educational strategies to promote environmentally responsible behavior. Educators can help students develop a stronger sense of environmental responsibility by implementing targeted interventions and promoting collaboration between schools, leading to a more sustainable future.

Table 6
Level of Environmental Responsible Behavior and School Type

Indicators	Chi-squared	p-value	Decision on Ho	Interpretation
Education action	54.678	0.091	Do not Reject Ho	Not Significant
Financial action	62.881	**0.007****	**Reject Ho**	**Significant**
Physical action	121.752	0.052	Do not Reject Ho	Not Significant
Persuasive action	81.250	0.072	Do not Reject Ho	Not Significant

*Significant at 0.05 level of confidence

The analysis of Table 7 highlights the relationship between the level of environmentally responsible behavior and residence location. In terms of education action and physical action, the results indicate no significant relationship with residence location (p-values of 0.112 and 0.292, respectively). This finding aligns with the notion that environmental awareness and responsibility can be fostered across various residential settings (Yavetz et al., 2014).

However, financial and persuasive actions significantly correlate with residence location (p-values of 0.031 and 0.019, respectively). The result suggests that where students live may influence their willingness to support environmentally responsible initiatives financially and their efforts to persuade others to adopt environmentally responsible behaviors. Past research supports that the residential environment can affect environmental behavior and decision-making (Duerden & Witt, 2010).

Further analysis of Table 7 suggests that the significant relationship between residence location and financial action may indicate that socio-economic factors or access to resources could influence students' financial support for environmentally responsible initiatives. For example, students from urban areas may have more exposure to environmental campaigns and opportunities to contribute financially. In contrast, students from rural areas might be more involved in hands-on environmental activities (Aguilar et al., 2019).

Additionally, the significant relationship between residence location and persuasive action indicates that students from different locations might have varying degrees of influence on their peers and communities. The result could be due to differences in cultural norms, social networks, or exposure to environmental issues (Heimlich & Ardoin, 2008).

These findings imply that educators should consider the unique challenges and opportunities presented by students' residence locations when designing interventions to promote environmentally responsible behavior. By understanding the specific context and resources available in each residential area, educators can develop tailored strategies that encourage students to engage in environmentally responsible actions relevant to their communities.

Finally, these findings emphasize the importance of considering the residential context when promoting environmentally responsible behavior among students. It is crucial to tailor educational interventions and strategies to the unique characteristics of students' residential environments to achieve optimal results. By doing so, educators can encourage a more comprehensive adoption of environmentally responsible behaviors, leading to a more sustainable future.

Table 7
Level of Environmental Responsible Behavior and Residence Location

Indicators	Chi-squared	p-value	Decision on Ho	Interpretation
Education action	29.084	0.112	Do not Reject Ho	Not Significant
Financial action	31.980	**0.031***	**Reject Ho**	**Significant**
Physical action	53.903	0.292	Do not Reject Ho	Not Significant
Persuasive action	50.811	**0.019***	**Reject Ho**	**Significant**

*Significant at 0.05 level of confidence

Table 8 analysis reveals significant relationships between Junior High School students' science performance and demographic factors such as sex, curriculum, school type, and residence location. These relationships emphasize the importance of considering these factors when designing educational interventions and assessing academic performance. Thus, addressing potential gender disparities in science education is crucial (Wang & Degol, 2017). Educators should create inclusive learning environments and provide targeted support for male and female students. In light of the curriculum's significant relationship with science performance, educators should adapt or improve the curriculum to foster deeper understanding and promote higher achievement (Bybee, 2015).

The relationship between school type and science performance indicates that factors specific to public or private schools may influence students' performance (Lubienski et al., 2016). Understanding different school types' unique challenges and opportunities helps educators develop tailored strategies for academic success. Therefore, students from different residential areas may face unique challenges or resources impacting their performance (Sirin, 2016). Addressing specific needs and contexts of diverse residential backgrounds is essential when designing interventions and supporting academic success.

In the Philippines, efforts have addressed challenges in science education, including teacher quality, resource availability, and curriculum implementation (Tayko et al., 2016). Table 8's significant relationships emphasize the importance of tailoring educational strategies to the Philippines' unique context. Furthermore, the Department of Education introduced the K to 12 curriculum to enhance students' competencies in science and other subjects. Research suggests that this curriculum can improve science performance among Filipino students (Castro et al., 2019). Continually evaluating the K to 12 curriculum's implementation and effectiveness is crucial.

While addressing disparities in science education based on school type and residence location is essential, as science education quality varies significantly between urban and rural schools (Azis et al., 2017). Allocating resources and providing targeted support to underserved areas ensures equal student opportunities.

Finally, understanding and addressing factors influencing Junior High School students' science achievement is essential. Acknowledging demographic factors and developing targeted strategies and interventions creates a more equitable and inclusive educational environment, promoting science learning and achievement for all students.

Table 8
Profiles and Academic Achievement in Science of Junior High School Students

Profiles	Chi-squared	p-value	Decision on Ho	Interpretation
Sex	14.272	**0.014***	**Reject Ho**	**Significant**
Curriculum	21.244	**0.001****	**Reject Ho**	**Significant**
School type	27.866	**0.002****	**Reject Ho**	**Significant**
Residence location	19.818	**0.001****	**Reject Ho**	**Significant**

*Significant at 0.05 level of confidence

The analysis of Table 9 demonstrates a negligible correlation ($r = 0.047$) between academic performance in science and the level of environmentally responsible behavior, which is not statistically significant ($p = 0.501$). The outcome suggests that no compelling relationship occur between students' science performance and environmentally responsible behavior.

This finding aligns with some studies that indicate environmental behavior may not be directly related to academic performance in science. For example, Wals et al. (2017) found that environmental education can have a broader impact on students' attitudes, values, and behavior beyond merely improving their science knowledge. Similarly, Corner et al. (2018) emphasized the importance of communication and social context in promoting environmental awareness and behavior change rather than focusing solely on academic performance in science.

However, it is essential to note that fostering environmentally responsible behavior remains a critical aspect of education, as it contributes to developing sustainable and responsible citizens. Although this paper did not find a significant relationship among academic performance in science and environmentally responsible behavior, it is still essential for educators to incorporate

environmental education into their curricula, as it promotes environmental awareness and the adoption of sustainable practices (Klöckner, 2015; Erdogan, 2009).

Furthermore, the analysis of Table 9, in conjunction with research conducted in the Philippines, highlights the complexity of the relationship between academic performance in science and environmentally responsible behavior among Filipino students. Although this study did not find a significant correlation between these two factors, it remains crucial to consider the contextual factors that may influence these outcomes.

In the Philippines, environmental education has been recognized as an essential component of the curriculum (Garcesa & Limjuco, 2014). However, the quality and effectiveness of environmental education may vary across schools and regions, which could account for the need for a strong relationship between science performance and environmentally responsible behavior observed in this study.

Therefore, educators and policymakers in the Philippines must continue exploring ways to improve environmental education and promote environmentally responsible behavior among students. The enhancement could involve integrating environmental issues into the science curriculum, providing additional teacher training and support, and fostering collaboration between schools and communities to create more meaningful and contextually relevant learning experiences (Heyl, Díaz, & Cifuentes, 2013).

Finally, the analysis of Table 9 emphasizes the importance of considering various factors and contexts when examining the relationship between academic performance in science and environmentally responsible behavior among students in the Philippines. By doing so, educators and policymakers can develop more targeted and practical strategies to promote environmental awareness and responsible behavior, ultimately contributing to a more sustainable future for the country.

Table 9
Level of Environmentally Responsible Behavior and Academic Achievement in Science

Variables	Pearson -r	Degree of correlation	p-value	Decision on Ho	Interpretation
Academic Performance vs. Environmentally Responsible Behavior	0.047	Negligible correlation	0.501	Do not Reject Ho	Not Significant

*Significant at 0.05 level of confidence

6. Conclusions and Recommendations:

In conclusion, this study aimed to investigate the relationship between academic performance in science, various demographic factors, and environmentally responsible behavior among Junior High School students in the Philippines.

The study revealed that respondents academic performance in science was significantly influenced by sex, curriculum, school type, and residence location (Table 8). These findings emphasize the importance of understanding and addressing the diverse factors that impact science learning and achievement in the Philippines, enabling educators to develop more effective, contextually relevant strategies to support student success.

Furthermore, the results showed moderate levels of environmentally responsible behavior across different categories, including education, financial, physical, and persuasive actions (Table 2). The preceding statement suggests room for improvement in students' engagement with environmental issues and underscores the need for targeted interventions and initiatives to encourage greater environmental responsibility.

Based on these findings, the following recommendations can be made:

1. Develop targeted interventions and support systems that address the specific needs of different student groups, considering factors such as sex, curriculum, school type, and residence location.
2. Enhance environmental education by incorporating more practical, hands-on activities that promote environmental responsibility and encourage students to protect the environment actively.
3. Encourage collaboration between schools, educators, and local communities to create a supportive network that fosters environmentally responsible behavior among students.
4. Implement teacher training programs focusing on effective teaching strategies for promoting environmental responsibility and emphasizing the importance of modeling environmentally responsible behavior.
5. Continuously evaluate and improve environmental education programs to ensure they remain relevant, engaging, and effective in promoting environmentally responsible behavior among students.

In summary, this study has provided valuable insights into the factors influencing academic performance in science and environmentally responsible behavior among Junior Highschool students in the Philippines. By considering these findings and implementing the recommended strategies, educators and policymakers can work together to create more equitable, inclusive, and environmentally conscious educational environments that foster student success and promote a more sustainable future for the country.

7. References

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