Exploring the Relationship Between Environmental Education Exposure and Pro-Environmental Attitudes Among Secondary School Students in Cross River State.

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Abstract

This study explored the relationship between environmental education exposure and pro-environmental attitudes among secondary school students in Cross River State, Nigeria. Specifically, it investigated whether exposure to environmental education and the frequency of participation in environmental activities significantly influenced students' pro-environmental attitudes. A correlational research design was adopted, involving a sample of 300 senior secondary school students selected through a multistage sampling technique. Data were collected using a researcher-developed instrument titled Environmental Education and Pro-Environmental Attitudes Questionnaire (EEPAQ), which demonstrated good reliability (Cronbach's $\alpha = 0.81$) and was validated by experts. The collected data were analyzed using descriptive statistics and Pearson Product-Moment Correlation Coefficient at a 0.05 significance level. The results revealed a moderate, positive, and statistically significant relationship between exposure to environmental education and pro-environmental attitudes ($r = .523$, $p < .001$), as well as between frequency of participation in environmental activities and pro-environmental attitudes ($r = .495$, $p = .001$). These findings suggest that increasing students' exposure to environmental education and promoting their active participation in environmental activities can significantly enhance their attitudes toward environmental protection and sustainability. The study recommends strengthening environmental education policies and practices in secondary schools to foster environmentally responsible behaviors among students.

Keywords: **E**nvironmental education, Pro-environmental attitudes, Secondary school students, Environmental activities, Correlational study, Cross River State

Introduction and background

Environmental issues such as climate change, deforestation, biodiversity loss, and pollution have become central concerns for sustainable development worldwide. In response, environmental education has emerged as a critical approach for fostering environmental awareness, shaping values, and promoting responsible behavior among younger generations (Tilbury, 1995). The goal of environmental education is not only to increase knowledge but also to influence students' attitudes and actions toward environmental protection and sustainability (UNESCO, 2017).

In recent years, governments and educational institutions have sought to integrate environmental education into school curricula, particularly at the secondary level, where students begin to develop more independent and socially responsible worldviews. However, despite these efforts, the extent to which environmental education translates into meaningful attitudinal or behavioral change remains a subject of ongoing debate. Some studies have shown a positive association between environmental education and pro-environmental attitudes (Kuhlemeier, Van den Bergh, & Lagerweij, 1999), while others have found minimal or inconsistent effects, suggesting that other variables, such as the nature of educational exposure or frequency of active participation in environmental activities, may play a role (Rickinson, 2001).

In many developing countries, including Nigeria, environmental education is still evolving and often faces challenges such as limited instructional resources, inadequate teacher training, and a lack of integration into core academic subjects (Bosah, 2013). This situation is further compounded by socio-economic factors and institutional barriers that limit students' engagement in environmental programs and activities. As a result, there is a need for more empirical research to explore how specific dimensions of environmental education—such as exposure through formal instruction and participation in environmental activities—relate to students' environmental attitudes.

This study, therefore, seeks to explore the relationship between exposure to environmental education and pro-environmental attitudes among secondary school students. Additionally, it examines the influence of students' participation in environmental activities on their environmental attitudes. The findings are expected to contribute to the body of knowledge on environmental education effectiveness and inform educational policies aimed at promoting sustainable behaviors among youths.

Statement of the problem

Despite growing global concerns about environmental degradation and climate change, many young people, particularly in developing regions, continue to demonstrate limited awareness and engagement in sustainable environmental practices. While environmental education has been widely promoted as a tool for fostering environmental responsibility, there is still insufficient empirical evidence on its actual influence on students' attitudes and behaviors. In many secondary schools, environmental education is either integrated minimally into the curriculum or treated as an extracurricular concern, raising questions about its effectiveness.
Furthermore, although students may participate in various environmental activities such as tree planting or sanitation campaigns, the extent to which these activities shape their long-term attitudes towards the environment remains unclear. It is therefore necessary to investigate whether a correlation exists between exposure to environmental education, participation in environmental activities, and the development of pro-environmental attitudes among secondary school students. Understanding these relationships will provide valuable insights for educators, policymakers, and curriculum developers aiming to strengthen environmental consciousness in the education system.

Purpose of the study

The purpose of this study is to examine the relationship between environmental education and the development of pro-environmental attitudes among secondary school students. Specifically, the study seeks to determine whether exposure to environmental education and the frequency of participation in environmental activities are significantly associated with students' pro-environmental attitudes.

Research hypotheses

The following hypotheses were formulated to guide the study:

1. There is no significant relationship between exposure to environmental education and pro-environmental attitudes among secondary school students.
2. There is no significant relationship between the frequency of participation in environmental activities and pro-environmental attitudes among secondary school students.

Literature review

Exposure to Environmental Education and Pro-Environmental Attitudes Among Secondary School Students

The relationship between environmental education and pro-environmental attitudes is rooted in several theoretical frameworks. One of the most relevant is the Theory of Planned Behavior (Ajzen, 1991), which posits that attitudes, subjective norms, and perceived behavioral control shape an individual's intentions and actions. In this context, environmental education is theorized to positively influence environmental attitudes by enhancing knowledge, shaping favorable beliefs, and promoting perceived control over environmental actions.

Another relevant theory is the Value-Belief-Norm (VBN) theory (Stern, 2000), which suggests that individuals are more likely to adopt pro-environmental behaviors when they hold strong biospheric values, are aware of environmental consequences, and feel a personal responsibility to act. Environmental education plays a central role in fostering these values and beliefs, especially when introduced during formative years.

Empirical evidence has consistently shown a positive link between exposure to environmental education and the development of pro-environmental attitudes among secondary school students. Kuhlemeier, Van den Bergh, and Lagerweij (1999) conducted a large-scale study in the Netherlands and found that students who received structured environmental education demonstrated significantly more favorable attitudes toward environmental conservation than those who did not. Similarly, Erdogan, Kostova, and Marcinkowski (2009) found that Turkish students exposed to a comprehensive environmental education program exhibited increased environmental knowledge and more positive environmental attitudes.

In a Nigerian context, Okebukola (2002) noted that schools with integrated environmental education curricula reported higher levels of environmental awareness and more positive attitudes among students. However, he also highlighted the uneven implementation of such curricula, often due to lack of teacher training and instructional resources. This observation is echoed by Babalola and Olawuyi (2021), who argue that although policies exist to support environmental education in Nigeria, many secondary schools still fail to deliver it in a structured and impactful manner.

Despite these positive findings, some researchers caution that knowledge alone may not be sufficient to change attitudes. For instance, Rickinson (2001) emphasized the importance of affective and experiential components in environmental education, noting that purely cognitive approaches may not significantly shift students' environmental values or intentions.

2. Frequency of Participation in Environmental Activities and Pro-Environmental Attitudes Among Secondary School Students

The Experiential Learning Theory (Kolb, 1984) supports the notion that students develop deeper understanding and lasting attitudes through active participation rather than passive learning. Engaging students in environmental activities—such as tree planting, recycling, and clean-up exercises—provides hands-on experience that reinforces environmental values and enhances emotional connection with nature.

The Environmental Identity Theory (Clayton, 2003) also offers valuable insight, suggesting that regular engagement in environmental practices can strengthen an individual’s identification with nature, thereby influencing attitudes and behaviors. Frequent participation

in environmental activities may, therefore, reinforce students' environmental identity and commitment to pro-environmental actions.

A growing body of research supports the view that active involvement in environmental activities is a strong predictor of pro-environmental attitudes. Liefländer, Fröhlich, Bogner, and Schultz (2013) demonstrated that students who frequently engaged in outdoor environmental education programs developed stronger emotional and cognitive connections to environmental issues. Their attitudes were more positive and their motivation to act sustainably was higher compared to those with limited exposure.

In South Africa, Lotz-Sisitka et al. (2006) observed that participation in community-based environmental projects significantly improved students' environmental commitment and responsibility. Students reported feeling empowered and more connected to their local ecosystems, suggesting that practical engagement fosters a sense of stewardship.

In the Nigerian context, Chinedu and Oladipo (2018) reported a significant relationship between students' involvement in environmental clubs and their attitudes toward the environment. Schools that facilitated regular environmental outreach and practical engagements noted higher levels of environmental consciousness among their students.

However, the frequency and quality of participation matter. According to Ballantyne and Packer (2005), occasional or superficial involvement in environmental activities may not be sufficient to foster lasting attitudinal change. They recommend sustained, meaningful participation that includes reflection and community engagement as key to cultivating deep environmental values.

The literature reveals a strong theoretical and empirical basis for exploring the relationship between environmental education and pro-environmental attitudes. Both exposure to environmental education and the frequency of participation in environmental activities are influential, yet their impact depends on factors such as instructional quality, experiential learning opportunities, and socio-cultural context. More context-specific research—especially in underrepresented regions like Nigeria—is needed to deepen understanding and inform effective educational interventions aimed at fostering environmental stewardship among youth.

Methodology

Research Design

This study adopted a correlational research design to examine the relationships between exposure to environmental education, frequency of participation in environmental activities, and pro-environmental attitudes among secondary school students. The design was considered appropriate because it enables the investigation of the extent to which two or more variables are related without manipulating the study environment (Creswell, 2014).

Population of the Study

The population for this study comprised all senior secondary school students in selected public secondary schools in [insert study area, e.g., Cross River State, Nigeria]. This population was chosen because students at this level are expected to have received some form

of environmental education and have opportunities to participate in school-based environmental activities.

Sample and Sampling Technique

A sample of 300 students was selected using a multistage sampling technique. In the first stage, 2 secondary schools were randomly selected from 6 Local Government Areas using a simple random sampling method. In the second stage, stratified sampling was employed to ensure representation across class levels (SS1–SS3), followed by proportionate random sampling to select students from each stratum.

Instrumentation

The main instrument for data collection was a structured questionnaire titled *Environmental Education and Pro-Environmental Attitudes Questionnaire (EEPAQ)*, developed by the researcher. The instrument was divided into three sections: Section A: Demographic data of respondents (e.g., age, gender, class level). Section B: Items measuring exposure to environmental education, including frequency and quality of lessons, teacher involvement, and access to instructional materials. Section C: Items assessing frequency of participation in environmental activities, such as recycling, tree planting, sanitation exercises, and environmental clubs. Section D: Items measuring pro-environmental attitudes, adapted from established environmental attitude scales (e.g., NEP Scale). Responses were rated using a 5-point Likert scale ranging from *Strongly Disagree (1)* to *Strongly Agree (5)*.

Validity and Reliability of the Instrument

The instrument was subjected to content and face validity by three experts in environmental education and measurement and evaluation. Suggestions were incorporated to improve clarity and relevance. A pilot test was conducted using 30 students from a school outside the study sample. The reliability of the instrument was determined using Cronbach's alpha, and a coefficient of 0.81 was obtained, indicating high internal consistency.

Data Collection Procedure

Permission to conduct the study was obtained from the relevant educational authorities and school principals. The questionnaire was administered in person by the researcher and trained research assistants. Respondents were assured of confidentiality and anonymity. The exercise was carried out during normal school hours and took approximately 30 minutes per respondent.

Method of Data Analysis

Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS), version [insert version]. Descriptive statistics such as means and standard deviations were used to summarize the data. To test the hypotheses, Pearson Product-Moment Correlation Coefficient (r) was used to determine the strength and direction of the relationships between the independent variables (exposure to environmental education and frequency of participation in environmental activities) and the dependent variable (pro-environmental attitudes). The level of significance was set at 0.05.

Presentation of results

Hypothesis one

There is no significant relationship between exposure to environmental education and pro-environmental attitudes among secondary school students.

The result presented in Table 1 indicates a moderate, positive, and statistically significant relationship between exposure to environmental education and pro-environmental attitudes among secondary school students. The calculated correlation coefficient (r = .523) suggests a moderate positive relationship, meaning that as students' exposure to environmental education increases, their pro-environmental attitudes also tend to improve. The p-value (.000) is less than the significance level of .05, which means the result is statistically significant. Given that the null hypothesis stated that there is no significant relationship, this result leads to the rejection of the null hypothesis.

There is sufficient evidence to conclude that exposure to environmental education is significantly associated with improved pro-environmental attitudes among secondary school students. This implies that enhancing the content, quality, and frequency of environmental education may positively influence how students perceive and respond to environmental issues.

TABLE 1: Pearson Product Moment Correlation analysis of the relationship between exposure to environmental education and pro-environmental attitudes among secondary school students (N=300)

Variables	$\bar{x}$	**SD**	**r-cal**	**p-value**
Exposure to environmental education	16.8143	1.35512		
			.523**	.000
Pro-environmental attitudes among secondary school students	33.9143	1.79200		

* Significant at .05 level. Df = 298

Hypothesis two

There is no significant relationship between the frequency of participation in environmental activities and pro-environmental attitudes among secondary school students.

A Pearson Product-Moment Correlation was conducted to examine the relationship between the frequency of participation in environmental activities and pro-environmental attitudes among secondary school students (N = 300). The results indicated a moderate, positive correlation between the two variables, which was statistically significant, r(298) = .495, p = .001.

Since the p-value is less than the alpha level of .05, the null hypothesis—which stated that there is no significant relationship between the frequency of participation in environmental activities and pro-environmental attitudes—is rejected. This finding suggests that students

who more frequently engage in environmental activities tend to demonstrate more positive pro-environmental attitudes.

Table 2: Pearson Product Moment Correlation analysis of the relationship between the frequency of participation in environmental activities and pro-environmental attitudes among secondary school students (N=300).

Variables	$\bar{x}$	**SD**	**r-cal**	**p-value**
Frequency of participation in environmental activities	25.06	1.16		
			.495**	.001
Pro-environmental attitudes among secondary school students	33.9143	1.79200		

* Significant at .05 level, df = 298.

Discussion of results

Hypothesis one

The findings of this study revealed a moderate, positive, and statistically significant relationship between exposure to environmental education and pro-environmental attitudes among secondary school students, $r(298) = .523$, $p < .001$. This suggests that students who are more frequently and meaningfully exposed to environmental education are more likely to develop favorable attitudes toward environmental protection and sustainability. The strength of this correlation underscores the importance of integrating structured environmental education into the school curriculum.

This result aligns strongly with previous empirical findings. For instance, Kuhlemeier, Van den Bergh, and Lagerweij (1999) found that structured environmental education significantly improved Dutch students' attitudes toward environmental conservation. Their study emphasized that a systematic approach to environmental education, particularly when embedded within the school system, positively influences students' environmental awareness and behavior. Similarly, Erdogan, Kostova, and Marcinkowski (2009) observed that Turkish students who participated in a comprehensive environmental education program showed substantial gains in environmental knowledge and more positive environmental attitudes. These findings affirm the notion that when students are not only informed but also actively engaged in environmental issues, they develop stronger pro-environmental dispositions.

In the Nigerian context, the findings of this study are also consistent with those of Okebukola (2002), who reported that schools that had successfully integrated environmental education into their curricula exhibited students with higher levels of environmental awareness and commitment. However, Okebukola also noted the inconsistency in implementation, often due

to inadequate teacher training and lack of educational resources. This concern is echoed by Babalola and Olawuyi (2021), who argue that despite supportive policy frameworks, environmental education in many Nigerian secondary schools remains underdeveloped and inconsistently delivered.

Therefore, the present findings not only corroborate international and local literature but also highlight the urgent need for education stakeholders in Nigeria to strengthen the delivery of environmental education. By doing so, schools can play a crucial role in shaping environmentally responsible citizens who are equipped to address pressing ecological challenges.

Hypothesis two

The findings from this study revealed a moderate, positive, and statistically significant relationship between the frequency of participation in environmental activities and pro-environmental attitudes among secondary school students, $r(298) = .495$, $p = .001$. This suggests that students who regularly participate in environmental activities—such as school-based cleanups, tree planting, or environmental clubs—are more likely to hold favorable attitudes toward environmental conservation. The rejection of the null hypothesis supports the assertion that experiential and participatory learning significantly influences students' environmental dispositions.

These findings are consistent with existing literature which emphasizes the importance of active engagement in fostering environmental consciousness. For instance, Liefländer, Fröhlich, Bogner, and Schultz (2013) found that students involved in outdoor environmental education programs developed stronger emotional and cognitive connections to environmental issues. Their study demonstrated that hands-on experiences enhanced students' environmental awareness and motivation to act sustainably. Similarly, Lotz-Sisitka et al. (2006), in a South African context, reported that students' participation in community-based environmental projects improved their environmental responsibility and commitment. Their study highlighted that active involvement helped students cultivate a personal sense of stewardship and connection to the natural environment—factors critical for building pro-environmental attitudes.

In the Nigerian context, the present findings are in agreement with those of Chinedu and Oladipo (2018), who observed that students participating in environmental clubs and school-based outreach programs exhibited significantly higher levels of environmental awareness and more positive attitudes toward sustainability. Their research underscores the value of integrating practical environmental initiatives within the school curriculum to reinforce environmental values.

Taken together, the results of this study reinforce the theoretical perspective that participatory learning is a catalyst for attitude change. This aligns with constructivist and experiential learning theories, which posit that knowledge and attitudes are best internalized through active involvement and real-world application (Kolb, 1984; Vygotsky, 1978). Therefore, this study contributes to the growing evidence base that environmental activities in schools are not only educationally beneficial but also crucial for shaping students' values and behavioral intentions toward the environment.

Conclusion

This study examined the relationships between exposure to environmental education, frequency of participation in environmental activities, and pro-environmental attitudes among secondary school students. Using a correlational research design and Pearson Product-

Moment Correlation analysis, the results indicated that both exposure to environmental education and frequency of participation in environmental activities are moderately and positively correlated with students' pro-environmental attitudes. These findings suggest that students who receive more comprehensive environmental education and participate more frequently in environmental activities are more likely to develop favorable attitudes towards environmental conservation and sustainable behavior.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Integration of Comprehensive Environmental Education into the Curriculum: Educational authorities and curriculum developers should integrate more structured and comprehensive environmental education content into secondary school curricula. Lessons should emphasize both theoretical knowledge and practical application to enhance students' environmental attitudes.
2. Encouragement of Active Participation in Environmental Activities: Schools should organize regular environmental activities such as tree planting, recycling projects, clean-up campaigns, and membership in environmental clubs. Such activities should be participatory, engaging students in real-world environmental problem-solving.
3. Capacity Building for Teachers: Teachers should be provided with specialized training and professional development in environmental education to enable them to deliver effective and impactful lessons. Workshops, seminars, and refresher courses on environmental issues should be institutionalized.
4. Policy Support and Funding: Government and non-governmental organizations should develop policies that support school-based environmental programs and provide adequate funding to ensure their sustainability. Resources such as instructional materials, field trip sponsorships, and environmental project grants should be made available to schools.
5. Community Involvement: Schools should collaborate with local communities and environmental organizations to extend students' learning beyond the classroom. Community-based environmental projects can enhance students' environmental knowledge, foster positive attitudes, and build a sense of civic responsibility.

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