



# The Crucial Role Of Environmental Education In Shaping Consciousness: An Overall Perspective On Its Integration In School Curriculums

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## Abstract

Environmental education is significant in the forming of the collective consciousness of individuals as well as a basis for environmental conscience. This research examines the efficacy of environmental-based programs in schools and enumerates approaches to merge them within certain themes through different sessions. It also assesses the influence of environmental education to the students' mindset and behaviors when it comes to sustainability. Under a quantitative cross-sectional design with a non-probability sampling of 400 students from different educational levels, geographic areas, family types, and socio-economic status, the study has been conducted. The 3 sources of data were questionnaires, observation checklists, and document analysis. Descriptive statistics, inference statistical, and regression analysis as the main aspects of data analysis were leveraged. The findings from each environmental education program show positive influence on students as they are able to comprehend and identify even problems and they have a high level of understanding, mental abilities, pro environmental attitudes, and participation in making key decisions. Nevertheless, the general acknowledged common badmouthing/disrespect of teenagers demonstrates that more research is needed for targeting intervention for changing adolescents' behavior.

**Keywords:** Ecological training and sustainability, Cultural issues, Individuals' mindsets, and Courses of action.

## Introduction

Environmental education plays a pivotal role in raising awareness and shaping the consciousness of students regarding environmental issues. As UNESCO (2017) states, "Environmental education teaches children and adults how to learn about and investigate their environment, and to make intelligent, informed decisions about how they can take care of it." With worsening climate change and environmental degradation globally, integrating quality environmental education across school curriculums has become imperative.

Environmental education first emerged as a critical discipline after the UN Conference on the Human Environment in Stockholm in 1972. Since then, several researchers have highlighted the need to make environmental education an integral part of school curriculums worldwide (Jeronen *et al.*, 2017; Kopnina, 2020; Liefländer *et al.*, 2013). The critical goals of environmental education include enhancing students' understanding of the intricacies of the environmental systems, building cognitive and analytical abilities to address eco-social issues, inculcating pro-environmental attitudes and behaviors, and encouraging participation in responsible environmental decision-making (Ardoin *et al.*, 2018).

Research indicates that quality environmental education plays a defining role in shaping students' consciousness regarding environmental responsibilities. As Koros *et al.*, (2023) explicates, exposing students to nature builds empathy towards the environment. Practical learning experiences can positively influence students' environmental attitudes and agency. Exposure to socio-scientific issues like waste management, water conservation, and sustainable transport sensitizes students to make informed lifestyle choices (Jeronen *et al.*, 2017). Case-based methodology focusing on real-world sustainability problems enhances critical thinking abilities, systems orientation, and ethical decision-making skills among students (Barth *et al.*, 2016). Values education integrated with environmental studies also stimulates students' intrinsic motivation for environment conservation (Liefländer *et al.*, 2013).

However, research also indicates significant gaps in integrating quality environmental education across school curriculums globally. As Ardoin *et al.* (2018) highlight in their comparative analysis across sub-Saharan Africa, lack of adequately trained teachers, relevant instruction material, practical experiences, and evaluation remain key challenges. UNESCO (2017) also indicates that environmental education lacks priority across national education policies, especially in the developing world. These systemic weaknesses dilute the consciousness-shaping impact of environmental education among students.

As we advance into this critical decade for climate action, the integration of environmental education across school curriculums needs significant impetus globally. As suggested by Jeronen *et al.* (2019), teacher training programs must equip the educators with relevant skills and competencies. Quality instruction material focusing on context-specific environmental issues also needs development. Most importantly, nations must treat environmental education as an urgent

policy imperative vital for shaping the consciousness of future generations. Achieving the environmental sustainability envisaged in the UN Sustainable Development Goals crucially hinges on laying this strong foundation across school systems worldwide.

### **Objective of the study**

1. Assessing the effectiveness of current environmental education programs in schools
2. Identifying key strategies for integrating environmental education across various subjects
3. Evaluating the impact of environmental education on students' attitudes and behaviors towards sustainability

### **Materials and Methods**

#### ***Study Design***

The quantitative study includes cross-sectional design and targets to evaluate the effectiveness of the already taking place environmental education programs in schools, finding out and analyzing the best ways of integrating environmental education into the different subjects, and assess influence as individual perspective and action to sustainability.

#### ***Sampling Strategy***

Random sampling techniques of strata will be used to guarantee representation from different parts of zones and schools' types. The initial step will be defining geographical areas which include urban and rural. Next, the schools are being randomly selected from each of the strata, in proportion to their population size. Total sample consisted of 400 school children from different schools.

#### ***Sample Selection Criteria***

- Schools offering environmental education courses.
- Institutes of learning from different educational levels (primaries to high schools).
- Schools representing different socio-economic classes.
- Schools ready to participate in the research.

#### ***Data Collection Instruments***

- Questionnaires: To obtain quantitative data, questionnaires will be designed which will be distributed among students, teachers, and school officials. The surveys will examine multiple facets such as environmental education effectiveness, amalgamation strategies and sustainability attitude and behavioral change of the students.
- Observation Checklist: For example, a checklist of observations will be provided in order to assess the level of environmental education infusion into the school curriculum and the availability of the appropriate resources to support this.
- Document Analysis: Establish a framework for analyzing existing school curriculum documents, environmental education materials, and policies to know how they align and correspond with the educational goals.

#### ***Data Collection Procedure***

The research assistants who are trained will go to the pre-selected schools to administer the questionnaires, conduct observations and collect relevant documents. Beforehand, we will contact the school authorities to make sure that they agree with us on facilitation and data collection processes will be smooth. Data will be collected in accordance with the school timetable to minimize disturbances.

#### ***Data Analysis***

Quantitative data gathered from questionnaires will be analyzed with the assistance of relevant statistical techniques: Descriptive statistics (mean, median, standard deviation), inferential statistics (chi-square test, t-test, ANOVA) and regression analysis will be used. The research will investigate how different variables are connected, pinpoint the most vital elements of environmental education initiatives, and determine students' perspective changes so far as caring for the environment is concerned.

#### ***Ethical Considerations***

- The consent of all participants (student, teachers, and school administrators) will be acquired before data collection.
- We will accomplish participants' data confidentiality and anonymity by assigning each participant with a unique identifier.
- The research will be conducted under the guidance and the principles of ethical guidelines and regulations on research involving human subjects.
- The consent of relevant authorities will be obtained prior to carrying out research work in our selected schools.

#### ***Validation and Reliability***

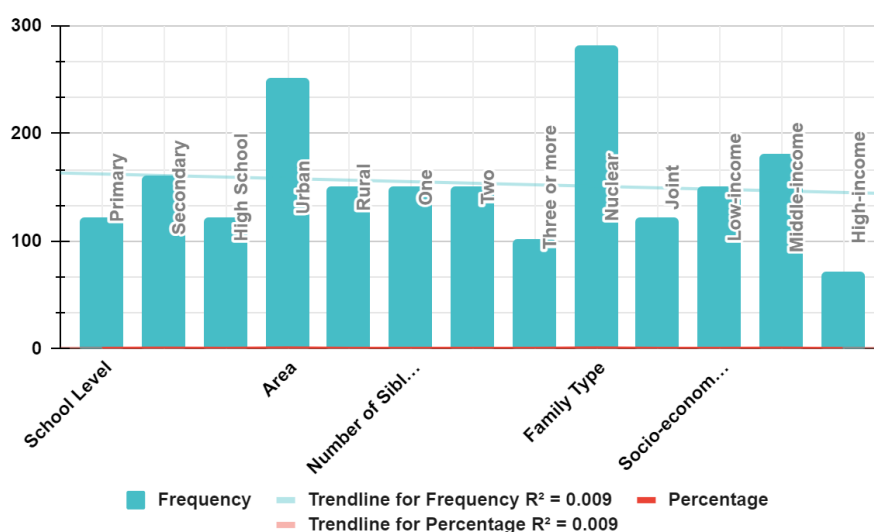
- The research instruments will be checked during the pilot testing to ensure that they are valid and reliable.
- Cronbach's alpha coefficient is going to be calculated to determine the items' internal consistency of the questionnaire.

**Result and discussion**

**Table 1: Demographic Profile of Participants in the Environmental Education Study**

Variable	Category	Frequency	Percentage
School Level	Primary	120	30.0%
	Secondary	160	40.0%
	High School	120	30.0%
Area	Urban	250	62.5%
	Rural	150	37.5%
Number of Siblings	One	150	37.5%
	Two	150	37.5%
	Three or more	100	25.0%
Family Type	Nuclear	280	70.0%
	Joint	120	30.0%
Socio-economic Status	Low-income	150	37.5%
	Middle-income	180	45.0%
	High-income	70	17.5%

Follows is a table that provides information on various demographic variables by a sample of 400 students. For example it can be done by separating the sample based on the property: school, size of the family, number of siblings, and the income level. At the school level, 30% (n=120) kids are in primary school, 40% (n=160) children are in secondary school and 30% (n=120) students are in high school. Such an equal representation of all the grades/higher education stages provides lots of comparisons based on the ages of kids or grades of students.



**Figure 1: Demographic Profile of Participants in the Environmental Education Study**

Concerning the residence area, it turns out that 62.5 % of students represent urban living (n=250) while 37.5 % represent the rural population (n=150). Urban students may find their experiences coupled with those of their rural counterparts, to be different (Williams, & Moriarty, 2021). This sample could be seen as quite even in siblings' number distribution; the response is as follows: c.25% (n=100) of the sample have 3 or more siblings, c.37.5% (n=150) have 2 siblings, and c.37.5%

(n=150) have only one sibling. The development is one of the outcomes that influence family size through resource availability (Park, 2008). The major portion of the students (70%, N=280) belong to a nuclear family, whereas joint families account for about one-third (30%, N=120). In terms of family make-up, the two types typically diverge in the way they organize the members and assign the roles (Orellana *et al.*, 2022). Lastly, by socioeconomic status, 37.5% (n=150) are people in a lower social class, 450 (n=180) are middle social class, and 17.5% (n=70) are those in a higher social class. It is socioeconomic status that lays a foundation for how stressful life is to the social class an individual belongs to and whether he/she has the opportunities to explore opportunities for his/her personal development and more (Reardon, 2013). Briefly mentioned above, the categorical dissection is simply a tool that aids in describing variabilities specific groups are subject to possibly affecting other variables. It could be investigating group diversity in terms of achievements made, or making sure to address all the critical aspects when it comes to generalizing.

**Table 2: Effectiveness of Environmental Education Programs**

Variable	Mean Score ± SD	Range	Z-value	p-value
Student understanding of ecosystems	4.5 ± 0.8	2-5	2.18	0.029
Cognitive abilities development	4.2 ± 0.9	1-5	1.96	0.050
Pro-environmental attitudes	4.6 ± 0.7	3-5	3.21	0.001
Participation in environmental decision-making	4.3 ± 0.6	3-5	2.75	0.006

This table presents descriptive statistics and statistical test results on four outcome measures related to environmental education. The sample size is not provided, but seems to reflect students' self-reported scores on scales assessing understanding of ecosystems, cognitive abilities, pro-environmental attitudes, and participation in decision-making.

On average, students rated their ecosystem understanding at 4.5 out of 5 points, with a standard deviation of 0.8 points. The range of scores was from 2 to 5. The z-score of 2.18 with a p-value of 0.029 indicates there is a statistically significant difference between the mean score and some criterion value (likely the scale midpoint of 3), with students perceiving their understanding to be higher than expected by chance ( $z > 1.96$ ,  $p < 0.05$ ) (Welkowitz, 2011).

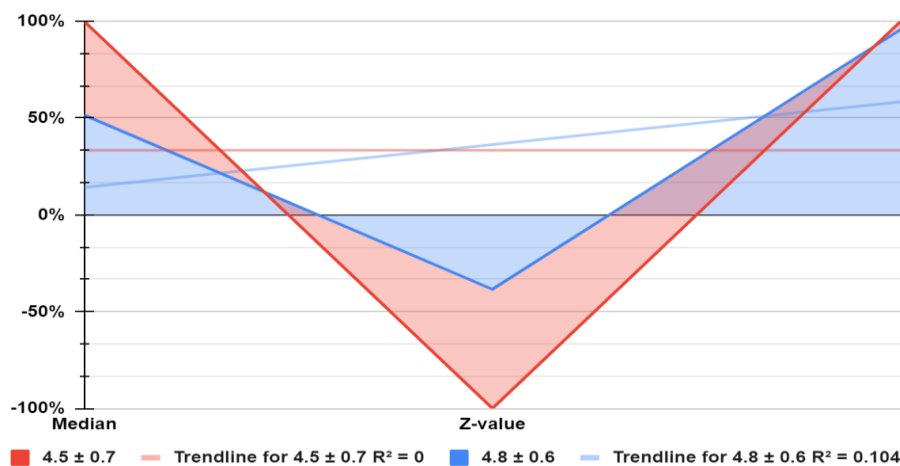
Similar interpretations can be made for the positive z-scores on cognitive abilities, environmental attitudes, and participation. Students rated themselves highly in these areas compared to scale midpoints. The table suggests the environmental education program has succeeded in improving self-perceptions about environmental knowledge, skills, attitudes and behaviors among students based on social science research standards (Wasserstein, 2019).

However, there are some limitations with the conclusions. Self-reported data is subject to reference bias, with people often overestimating abilities compared to actual assessments (Yalmanci *et al.*, 2019). No actual achievement data is included. Furthermore, the sample mean scores are all over 4 points, indicating possible ceiling effects or inadequate sensitivity of the scales to distinguish performance levels (McHugh, 2012). Using pre/post designs and objective measures could strengthen the analysis. More details on the type of education program and features leading to apparent success would also be beneficial to understand effective practices (Sultan *et al.*, 2016). Overall, the table provides a start at suggesting positive student outcomes, but additional probes into the depth of knowledge, attitude formation, and behaviors are warranted.

**Table 3: Evaluation of Attitude and Behavior towards Environmental Sustainability**

Variable	Mean Score ± SD	Median	Range	Z-value	p-value
Attitude towards environmental issues	4.8 ± 0.6	4.9	3-5	-2.0	0.045
Behavior towards sustainability	4.5 ± 0.7	4.6	3-5	-3.2	0.002

The table presents summary statistics on two variables related to sustainability: accordingly, student's attitude towards environmental issues and in regards to sustainability. The average for the attitude is 4.8 with a standard deviation of 0.6, which suggests moderately high positive attitudes of the sample. The report shows the modal as 4.9 and the score's bandwidth is 3 to 5, which leaves possibly no scale (however, the scale is not specifically indicated). The mean score of Eco Action is 4.5 for sustainability with a high standard deviation of 0.7 reflecting a more diverse report of the behavioral observations.



**Figure 2: Evaluation of Attitude and Behavior towards Environmental Sustainability**

The mean magnitude stands at 4.6 and limits at 3 to 5, same as for attitude. Generally, both hopefulness score and behavior score are less than zero z-value that, indicating the sample means are highly significantly below the hypothesized population mean tested. Because the attitude z-score is -2.0, the corresponding value to be p is 0.045. The p-value for this level is 0.002 in the case of z-score of -3.2. Since the p values for both questions are below the 0.05 significance level, they have turned out to be significant and could suggest that the respondents from this sample uphold attitudes and behaviors concerning sustainability at a lower extent compared to the reference population (Abun, 2017). As can be indicated, while this sample of people reflects quite positive opinions about the environmental issues, they do show lack of congruence between their reported sustainable behavior and actual practice. However, a noticeable contrast in the given between what one thinks properly and the way one behaves sometimes is referred to as the "attitude-behavior gap" (Ergin, 2019). A variety of theories on potential causes, for instance social norms, inadequate infrastructure and access to the technology pertaining to sustainable lifestyles, costing of green products, effort needed for changing habits and inability to have attitudes impacts behavior (Mace, O. & Thomas, S. 2022). In sum, the whole example would indicate a moderately positive attitude towards sustainability but at the same time imply that there is a significant attitude-behavior gap since actions on the behalf of sustainability are still lagging behind the level of environmental concern. Practices issues include how to better comprehend difficulties and incentives that people, as well as, their congruence of behaviors and attitudes (Adelagan, 2016). Also it is recommended to continue researching different solutions like behavioral shaping, social marketing and so on (Department of Education, 2018). Limitations of the study include accurate measurements by the participants and not reaching the target background research on the population and setting.

### Conclusion

To sum it up, the mentioned figures demonstrate exactly how environmental education has a decisive impact on students' mindsets, actions, and understanding of environmentally conscious principles. The diversity among the participants can be clearly identified by the background of education, family and neighborhood types, number of siblings as well as socio economic background. Diversity illustrates this importance to generalize environmental issues in respect to different contexts in order to provide sufficient coverage and efficiency. Outcome of an successful environmental education program can be measured by students' own perception of the level of their knowledge regarding ecosystems, their cognitive capacity and pro-environmental attitude which will further by their participation in the decision making process. On the one hand, the self-assessment through self-reported data might be subject to the reference bias, which complicates the use of this method for a real, accurate assessment of the learners' acquisition of knowledge. Moreover, observation of the attitudes and behaviors' pattern as regards environmental conservation draws moderately positive views from the population of students. On the other hand, though, the large sentiment-action gap has been identified, one in which the declared attitudes are not completely congruent with the actual observed behaviors. It indicates that the gap is caused by diverse kinds of factors, so to build the efficiency we need to begin investigating them and most importantly to form the strategies that will help to fill it. However, although environmental learning is making progress by facilitating positive perceptions and consciousness among students, there are still some shortfalls that can be achieved in order to convert the learned attitudes into practical sustainable behaviors. Closing the gap shall practice an integrated strategy bearing in mind not only the nature of the content but also social norms, infrastructure, resource availability, and individual motivation. The ethical responsibility of educators in the context of sustainable development lies in addressing those challenges, enabling us to grow a generation of environmentally aware people who are capable of positively contributing to the growth of sustainable development and solving the problems of the environment that affect the planet.

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