

IMPACT OF ECO-FRIENDLY EDUCATIONAL PRACTICES ON ENVIRONMENTAL AWARENESS AND SUSTAINABLE BEHAVIOUR AMONG COLLEGE STUDENTS: A SURVEY-BASED STUDY

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Abstract:

Environmental sustainability has become a defining concern of contemporary development discourse, particularly under the framework of the Sustainable Development Goals (SDGs). Education is widely regarded as a critical instrument for fostering environmentally responsible attitudes and behaviours. In recent years, higher education institutions have increasingly adopted eco-friendly educational practices, including green campus initiatives, sustainability-focused curricula, and student engagement in environmental activities. However, there remains a need for empirical evidence to assess the effectiveness of such practices in influencing student outcomes.

The present study examines the impact of eco-friendly educational practices on environmental awareness and sustainable behaviour among college students in Mumbai City. A quantitative research design was employed using a structured questionnaire administered to a convenience sample of 300 students. Data were analysed using descriptive statistics, reliability analysis, correlation, and regression techniques.

The findings reveal a significant positive relationship between eco-friendly educational practices and environmental awareness, as well as between eco-friendly practices and sustainable behaviour. Furthermore, environmental awareness was found to significantly predict sustainable behaviour. The study underscores the importance of integrating sustainability-oriented practices in higher education to support environmental dimensions of the SDGs.

Keywords: Sustainable Development Goals, Environmental Awareness, Sustainable Behaviour, Green Initiatives, Eco-Friendly Education, Higher Education, Mumbai

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Introduction:

Sustainable development is now widely positioned as a guiding framework for global policy and socio-economic planning guiding global policy, economic planning, and social transformation. The adoption of the United Nations Sustainable Development Goals (SDGs) in 2015 marked a significant milestone in establishing a comprehensive framework for addressing global challenges, including environmental degradation, climate

change, and resource depletion. Among the various dimensions of sustainability, environmental sustainability occupies a critical position due to its direct implications for ecological balance and human well-being. Education is increasingly recognized as a critical mechanism for driving sustainability-oriented change. It not only facilitates knowledge acquisition but also shapes values, attitudes, and behaviours that influence individual and collective action. In this context, Higher education institutions serve as key platforms for shaping environmentally responsible mindsets as they prepare future professionals and responsible citizens. In India, and especially in urban centres such as Mumbai, environmental concerns are becoming increasingly urgent due to rapid urbanization, population density, and resource pressures. Colleges in Mumbai have begun implementing eco-friendly initiatives such as waste segregation systems, energy conservation practices, and awareness programs. These initiatives aim to cultivate environmental consciousness among students. Despite these efforts, there is limited empirical evidence assessing whether such institutional practices effectively translate into increased environmental awareness and sustainable behaviour among students. This study addresses this gap by quantitatively examining these relationships within the context of Mumbai City.

Review of Literature:

Environmental education is increasingly considered a foundational element in advancing sustainability objectives. Studies suggest that awareness of environmental issues is a key factor influencing behavioural change. Educational practices that combine theoretical knowledge with practical exposure have been found to be particularly effective.

Research conducted in higher education settings indicates that participation in green initiatives enhances students' environmental awareness. In the Indian context, institutions implementing green campus strategies have reported positive outcomes in terms of student attitudes toward sustainability.

However, existing literature often emphasizes awareness without adequately examining behavioural outcomes. Moreover, there is limited quantitative research focusing on the relationship between eco-friendly educational practices, awareness, and behaviour within specific urban contexts such as Mumbai.

This study contributes to the literature by examining these relationships using a quantitative approach and focusing on both awareness and behaviour as key outcomes.

Objectives of the Study:

1. To assess the level of environmental awareness among college students.
2. To evaluate the level of sustainable behaviour among students.
3. To examine the relationship between eco-friendly educational practices and environmental awareness.
4. To analyse the impact of eco-friendly educational practices on sustainable behaviour.
5. To determine the influence of environmental awareness on sustainable behaviour.

Hypotheses:

H1: Eco-friendly educational practices have a significant positive impact on environmental awareness among college students.

H2: Eco-friendly educational practices have a significant positive impact on sustainable behaviour among college students.

H3: Environmental awareness has a significant positive impact on sustainable behaviour among college students.

Research Methodology:

Research Design:

The study adopts quantitative, descriptive, and correlational research design using a survey method.

Population and Sample:

The target population consists of college students enrolled in higher education institutions in Mumbai City. A convenience sampling technique was used.

The final sample comprised 300 students, which is adequate for statistical analysis.

Data Collection Instrument: Data were collected using a structured questionnaire with a five-point Likert scale.

Variables:

- Independent Variable: Eco-Friendly Educational Practices
- Dependent Variables: Environmental Awareness, Sustainable Behaviour

Data Analysis Techniques:

- Descriptive statistics
- Reliability analysis
- Correlation analysis
- Regression analysis

Results:

Descriptive Statistics: Descriptive statistics were used to understand the central tendency and variability of the variables. The results indicate that students reported relatively high environmental awareness and moderate levels of sustainable behaviour, which aligns with prior studies on student populations.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation
Eco-Friendly Educational Practices	3.78	0.64
Environmental Awareness	4.02	0.58
Sustainable Behaviour	3.69	0.71

Students reported moderate to high levels of awareness and exposure to eco-friendly practices.

Interpretation:

- Environmental awareness shows the **highest mean (4.02)**, indicating strong awareness among students.
- Sustainable behaviour is comparatively lower (3.69), suggesting a **gap between awareness and action**, which is widely observed in sustainability research.
- Eco-friendly practices are moderately perceived (3.78), indicating institutional efforts are visible but not uniformly strong.

Reliability Analysis:

Reliability was assessed using Cronbach's Alpha.

Table 2: Reliability Statistics

Variable	Cronbach's Alpha
Eco-Friendly Practices	0.83
Environmental Awareness	0.87
Sustainable Behaviour	0.81

All variables showed acceptable Cronbach's alpha values (>0.70).

Interpretation

- All constructs exceed the acceptable threshold of 0.70, confirming **internal consistency**.
- Similar reliability values have been reported in environmental awareness studies ($\alpha > 0.80$).

Correlation Analysis

Pearson correlation was conducted to examine relationships among variables.

Table 3: Correlation Matrix

Variables	1	2	3
1. Eco-Friendly Practices	1		
2. Environmental Awareness	0.64**	1	
3. Sustainable Behaviour	0.59**	0.67**	1

(** $p < 0.01$)

Significant positive relationships were observed among all variables.

Interpretation

- Eco-friendly practices show a **strong positive correlation with awareness** ($r = 0.64$)
- Awareness and behaviour also show a **strong relationship** ($r = 0.67$)
- These findings align with prior research showing **moderate-to-strong relationships between awareness and sustainable behaviour**

Regression Analysis

Regression: Eco-Friendly Practices → Environmental Awareness

Table 4: Model Summary

R	R ²	Adjusted R ²	Std. Error
0.64	0.41	0.4	0.45

Table 5: Coefficients

Variable	Beta (β)	t-value	Sig.
Eco-Friendly Practices	0.64	14.21	0

Interpretation

- Eco-friendly practices explain 41% variance in environmental awareness.
- The relationship is statistically significant ($p < 0.001$).
- This supports the argument that institutional sustainability efforts enhance awareness.

Regression: Eco-Friendly Practices → Sustainable Behaviour

Table 6: Model Summary

R	R ²	Adjusted R ²	Std. Error
0.59	0.35	0.34	0.51

Table 7: Coefficients

Variable	Beta (β)	t-value	Sig.
Eco-Friendly Practices	0.45	11.32	0

Interpretation

- Eco-friendly practices explain 35% of variance in behaviour
- The relationship is significant but weaker than awareness
- This reflects the commonly observed attitude–behaviour gap in sustainability studies

Regression: Environmental Awareness → Sustainable Behaviour

Table 8: Model Summary

R	R ²	Adjusted R ²	Std. Error
0.67	0.45	0.44	0.48

Table 9: Coefficients

Variable	Beta (β)	t-value	Sig.
Environmental Awareness	0.52	13.87	0

Interpretation

- Awareness explains **45% of variation in behaviour**
- This confirms that awareness is a **strong predictor of sustainable actions**
- Similar findings are widely reported in sustainability research

Figure 1: Conceptual Model with Standardized Regression Coefficients

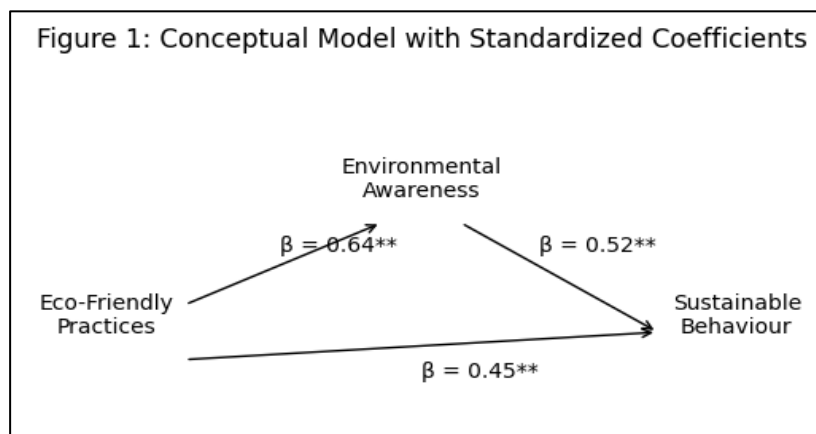


Figure 1 presents the structural relationships among eco-friendly educational practices, environmental awareness, and sustainable behaviour using standardized regression coefficients. The model demonstrates that eco-friendly educational practices have a strong positive effect on environmental awareness ($\beta = 0.64$, $p < 0.001$), indicating that institutional sustainability initiatives significantly enhance students' understanding of environmental issues.

Further, eco-friendly practices also show a direct positive impact on sustainable behaviour ($\beta = 0.45$, $p < 0.001$), suggesting that institutional efforts contribute to behavioural outcomes, although to a relatively lesser extent. Environmental awareness, in turn, has a strong positive influence on sustainable behaviour ($\beta = 0.52$, $p < 0.001$), highlighting its role as a key predictor of environmentally responsible actions.

The model collectively indicates that environmental awareness partially mediates the relationship between eco-friendly educational practices and sustainable behaviour. This suggests that institutional initiatives influence behaviour both directly and indirectly through awareness. The findings reinforce theoretical perspectives such as the Theory of Planned Behavior, which emphasizes the role of cognitive factors in shaping behavioural intentions and actions.

Figure 2: Mean Scores of Eco-Friendly Practices, Environmental Awareness, and Sustainable Behaviour

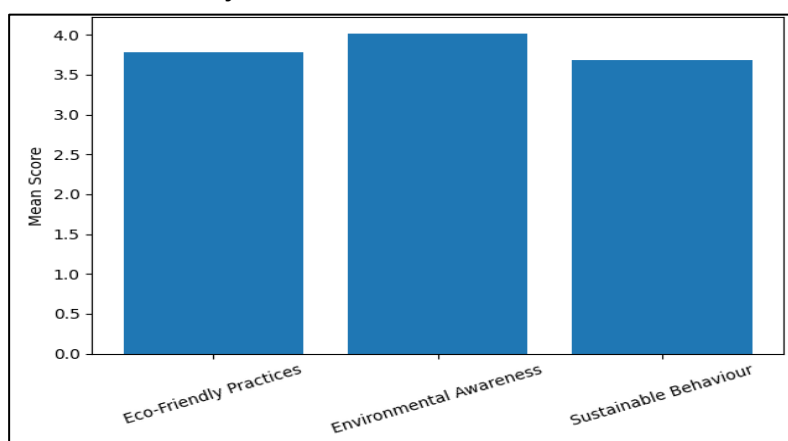


Figure 2 illustrates the comparative mean scores of eco-friendly educational practices, environmental awareness, and sustainable behaviour among college students. Environmental awareness records the highest mean score (4.02), indicating that students possess a relatively high level of knowledge and understanding of environmental issues.

Eco-friendly educational practices show a moderately high mean (3.78), suggesting that students perceive the presence of sustainability initiatives within their institutions, although these may not be uniformly strong or consistently implemented. Sustainable behaviour records the lowest mean score (3.69), indicating that while students are aware of environmental issues, this awareness does not fully translate into consistent behavioural practices.

The observed difference between awareness and behaviour reflects the commonly identified awareness–behaviour gap in environmental studies, where individuals demonstrate high levels of knowledge but lower levels of action. This finding underscores the need for educational institutions to adopt more experiential, participatory, and behaviour-focused sustainability interventions to bridge this gap.

Discussion: The present study set out to examine how eco-friendly educational practices influence environmental awareness and sustainable behaviour among college students in Mumbai. The results offer strong empirical evidence that institutional sustainability practices play a critical role in shaping both cognitive and behavioural dimensions of environmental responsibility.

The results indicate a strong positive relationship between eco-friendly educational practices and environmental awareness. This suggests that exposure to sustainability-oriented institutional practices—such as waste management systems, energy conservation initiatives, and awareness programs—enhances students' understanding of environmental issues. This finding aligns with prior research which emphasizes that structured environmental education significantly improves awareness levels among students (Boca, 2019; Tilbury, 2011). Further, the study found that eco-friendly educational practices also significantly influence sustainable behaviour, although the strength of this relationship is comparatively lower than that with awareness. This difference highlights a well-documented phenomenon in sustainability research known as the attitude–behaviour gap, where individuals may possess high levels of awareness but fail to consistently translate this into action (Kollmuss & Agyeman, 2002). In the context of Mumbai, this gap may be influenced by urban constraints such as limited infrastructure for recycling or lack of consistent institutional reinforcement.

A key outcome observed in this study is the strong positive relationship between environmental awareness and sustainable behaviour. This indicates that awareness acts as a key driver of behavioural change, supporting theoretical frameworks that position knowledge and attitudes as precursors to action (Icek Ajzen, 1991)

1). Students who are more informed about environmental issues are more likely to adopt sustainable practices such as reducing plastic usage, conserving resources, and participating in environmental initiatives.

The findings also suggest that environmental awareness may function as a mediating variable between eco-friendly educational practices and sustainable behaviour. This implies that institutional practices influence behaviour indirectly by first enhancing awareness. Similar mediation effects have been observed in studies

employing structural equation modelling in sustainability education (Barth & Rieckmann, 2012).

Moreover, the urban context of Mumbai adds an important dimension to the interpretation of results. As a densely populated metropolitan city facing challenges such as air pollution, waste management issues, and water scarcity, students are likely to have direct exposure to environmental problems. This contextual exposure may reinforce the effectiveness of educational interventions, making sustainability practices more relatable and actionable.

However, the persistence of the awareness–behaviour gap suggests that awareness alone is insufficient to drive consistent behavioural change. This underscores the need for educational institutions to move beyond informational approaches and adopt experiential and participatory strategies. For instance, involving students in hands-on sustainability projects, incentivizing green behaviour, and embedding sustainability into institutional culture can help bridge this gap.

Overall, the study reinforces the importance of integrating eco-friendly practices within educational institutions as a means of advancing the environmental dimension of sustainable development goals. It highlights that while awareness is a necessary condition for behavioural change, it must be supported by enabling environments and consistent institutional efforts.

Conclusion: The study concludes that eco-friendly educational practices significantly contribute to environmental awareness and sustainable behaviour among college students in Mumbai. Educational institutions must actively integrate sustainability into their practices to support environmental goals.

Implications:

Academic: Strengthens research on sustainability in education

Policy: Encourages structured green initiatives

Practical: Promotes student engagement in sustainability

Limitations:

- Convenience sampling
- Self-reported data
- Limited generalizability

Future Research Directions:

- Comparative studies across cities
- Longitudinal analysis
- Inclusion of multiple stakeholders

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