



Environmental Awareness with a Focus on Plant Diversity in the Context of Sustainable Development: A Gender, Locality, and Stream-Based Comparative Analysis among B.Ed. Students

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Abstract- This study investigates environmental awareness with a focus on plant diversity in the context of sustainable development among B.Ed. students in Uttarakhand, India. Recognizing the global challenge of biodiversity loss and the prevalence of “plant blindness,” the research aimed to measure students’ environmental awareness and examine differences across gender, locality, and academic stream. A sample of 109 B.Ed. students was selected through stratified random sampling. Data were collected using a validated 30-item Environmental Awareness Scale (Cronbach’s $\alpha = 0.925$; Split-half = 0.901; EFA explained variance = 73.7%). Statistical analyses, including independent sample t-tests and one-way ANOVA, were conducted using SPSS. The findings revealed moderate-to-high levels of environmental awareness among students, with no statistically significant differences across gender, locality, or academic stream. These results suggest that teacher education programs in the region provide a relatively uniform exposure to environmental education. The study emphasizes the need for curriculum reforms that integrate biodiversity and experiential learning to deepen ecological literacy. Policy implications are discussed in the light of the National Education Policy (NEP) 2020 and the Sustainable Development Goals (SDG 4 and SDG 15).

Keywords- Environmental Awareness; Plant Diversity; Sustainable Development; Teacher Education; Gender; Locality; Academic Stream

I. Introduction

The twenty-first century has witnessed an unprecedented ecological crisis, with biodiversity loss posing one of the greatest challenges to humanity’s sustainable future. Among various dimensions of biodiversity, plant diversity often remains neglected in both research and education, a phenomenon referred to as “plant blindness” (José et al., 2019). This lack of recognition not only limits ecological literacy but also weakens conservation efforts, despite plants’ crucial role in maintaining ecological balance and supporting human survival (Achurra, 2022; Parsley, 2020). Recent studies have shown that targeted educational interventions, such as botanical priming, can mitigate plant blindness and enhance attention to plant diversity (Zani & Low, 2022).



Education has been globally recognized as a key instrument for addressing environmental challenges. The United Nations' Sustainable Development Goals (SDGs), particularly SDG 4 (quality education) and SDG 15 (life on land), stress the integration of environmental sustainability into educational systems. In India, the National Education Policy (NEP) 2020 emphasizes environmental education, sustainability, and ecological responsibility as core components of holistic development (Saluja et al., 2024). Teacher trainees, as future educators, occupy a central role in shaping environmentally conscious citizens, making it critical to assess their awareness of environmental and biodiversity issues.

Research on environmental awareness in India has largely focused on general awareness levels, with limited attention to the specific dimension of plant diversity. Furthermore, most studies have not systematically validated measurement tools, resulting in inconsistencies across findings. To bridge this gap, the present study developed and validated an Environmental Awareness Scale (EAS) and applied it to assess awareness among B.Ed. students in Uttarakhand.

The study also explores whether demographic variables such as gender, locality, and academic stream influence environmental awareness. These comparisons are crucial, as previous studies have reported mixed results—some indicating significant differences based on gender and locality, while others suggest uniformity across groups. By focusing on B.Ed. students, this research contributes not only to understanding current levels of awareness but also to identifying areas where teacher education curricula can be strengthened. This research seeks to fill an important gap by examining how prospective teachers view and interact with the idea of plant diversity in relation to environmental awareness and sustainable development. By investigating variations across gender, locality, and academic stream, the research aims not only to generate empirical insights but also to inform teacher education policies and practices. The findings are expected to contribute significantly to curriculum development, promote more inclusive and context-sensitive approaches to biodiversity education, and support national and global efforts to build a generation of teachers who are environmentally conscious, socially responsible, and equipped to inspire sustainable living among their students.

II. Review of Related Literature

Research on environmental awareness (EA) among students shows mixed findings across gender, locality, and academic background. Studies in Karnataka revealed no significant gender differences in EA among post-graduate students, except in one case where female science students scored higher (Shiva kumara et al., 2015). Similarly, a study of B.Ed. students in Haryana reported no significant difference in responsible environmental behavior by gender or locality (Sarita, Kavita, & Kumar, 2015). However, other research has noted that female and urban students often display higher environmental concern, particularly regarding pollution and ecological issues (Dhara & Das, 2024).



At the secondary level, a study in Coimbatore found gaps in knowledge and behavior across schools, highlighting that awareness is not evenly distributed (Dhanya & Pankajam, 2017). College-level research also suggests that while environmental knowledge is moderate, attitudes and pro-environmental behaviors lag behind, indicating a disconnect between awareness and practice (Usha Shri & Tiwari, 2021). International and classical literature emphasizes the role of significant life experiences and formative contexts in shaping environmental sensitivity (Chawla, 1998, 2001). Reviews of environmental education in Indian schools suggest that curricula remain largely theoretical, with insufficient experiential components such as biodiversity projects and ecological fieldwork (Mishra, 2025).

III. Theoretical Background

Environmental education has shifted from a knowledge-based model toward one emphasizing experiential learning, reflection, and sustainable values (Chawla, 1998). Within this framework, constructivist learning theory is highly relevant: learners actively construct understanding through hands-on engagement, field experiences, and social interaction.

The concept of ecological literacy stresses the importance of biodiversity including plant diversity as critical to ecosystem functioning and human well-being. This directly connects with global sustainability priorities such as SDG 4 (Quality Education) and SDG 15 (Life on Land).

Teacher education plays a pivotal role in this process. As future educators, B.Ed. students can influence young learners by integrating biodiversity awareness, experiential activities (e.g., local plant surveys, school gardens), and sustainability-oriented pedagogy. Strengthening biodiversity components within teacher training curricula is therefore essential for advancing sustainable development.

IV. Objectives of the Study

- To assess the level of environmental awareness, with a focus on plant diversity, among B.Ed. students in Uttarakhand.
- To compare environmental awareness levels across gender, locality, and academic stream.
- To suggest educational and policy interventions for strengthening biodiversity literacy and sustainability education.

Hypotheses

H₁: There is no significant difference in environmental awareness between male and female B.Ed. students.

H₂: There is no significant difference in environmental awareness among B.Ed. students across locality (urban, semi-urban, rural).

H₃: There is no significant difference in environmental awareness among B.Ed. students across academic streams (arts, science, commerce).

V. Material and Methods

Research Design

The present study adopted a descriptive survey design to assess environmental awareness among B.Ed. students. This design was considered appropriate because it enables systematic collection, analysis, and interpretation of quantitative data from a representative sample, providing insights into existing levels of awareness and potential demographic variations.

Study Area

This section outlines the geographical and institutional context of the present study. The selected study area is Dehradun, the capital of Uttarakhand, located in the northern part of the India. Nestled in the foothills of the Himalayas, Dehradun is part of the Doon Valley, bordered by the Ganges on the east and the Yamuna on the west, with the Shivalik and Lesser Himalayan ranges enclosing it.



Figure 1. Map showing the study area: Dehradun District, Uttarakhand, India.
Source: Kumar, Pravendra & Luthra, Kaushik. (2016).

VI. Geographical Context

Dehradun district is known for its diverse topography, pleasant climate, and ecological richness, which make it a vital center for both environmental and educational research. The district includes urban areas like Dehradun city, suburban zones like Raipur and Rajpur Road, and nearby rural regions like Vikasnagar and



Doiwala. This mix provides an ideal setting for comparative research based on variables such as urban vs. rural locality.

The region's natural environment, featuring forested areas, rich plant biodiversity, and proximity to hill stations such as Mussoorie, makes it especially relevant for studies focusing on EA and plant diversity. Its location in the eco-sensitive Himalayan belt further adds to the importance of ecological education among teacher trainees.

VII. Institutional Context

The study focused on three NCTE-approved universities: Maya Devi University, Jigyasa University, The ICFAI University, Dehradun, these institutions enroll B.Ed. students from varied genders, localities, and academic streams (Science and Arts), making them suitable for stratified sampling. Their diversity ensured representation of multiple socio-cultural and educational backgrounds.

VIII. Population and Sample

The population consisted of all B.Ed. students enrolled in teacher training institutions of Dehradun region.

- Pilot Study: Conducted on 30 students to test the reliability and factors of the developed EA scale.
- Main Study: Data were collected from 107 B.Ed. students through an online Google Form survey. The link was circulated in official university WhatsApp groups, ensuring convenient and ethical participation.
- Dehradun district, with its ecological sensitivity and academic diversity, provided an ideal setting to examine EA related to plant biodiversity. The selected institutions and representative sample allowed robust comparative analysis across gender, locality, and academic stream among B.Ed. students.
- The distribution of the sample was as follows:
- Gender: Male (n = 52), Female (n = 57)
- Locality: Urban (n = 39), Semi-urban (n = 34), Rural (n = 36)
- Academic Stream: Arts (n = 42), Science (n = 35), Commerce (n = 32)

IX. Tool of the Study

The Environmental Awareness Scale (EAS) was developed specifically for this research with a focus on plant diversity and sustainable development. The process of tool construction followed six stages:

- Item Generation: An initial pool of 45 items was developed based on an extensive review of literature, policy documents (NEP 2020, UNESCO, UNEP reports), and expert consultations.
- Expert Validation: Items were reviewed by subject experts in environmental science, botany, and education to establish content validity.
- Pilot Study: The scale was piloted on 30 B.Ed. students to refine item clarity, readability, and relevance.
- Item Analysis: Low-performing items (item-total correlation < .30) were removed, resulting in a final pool of 30 items.

- Exploratory Factor Analysis (EFA): Conducted to establish construct validity, the EFA revealed a six-factor solution explaining 73.7% of total variance.
- Reliability Testing: Internal consistency reliability was established with Cronbach's $\alpha = 0.925$, while split-half reliability (0.901) and Spearman-Brown coefficient (0.894) confirmed the stability of the instrument.

The final scale consisted of 30 items rated on a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The minimum score possible was 30, and the maximum score was 150, with higher scores indicating greater environmental awareness.

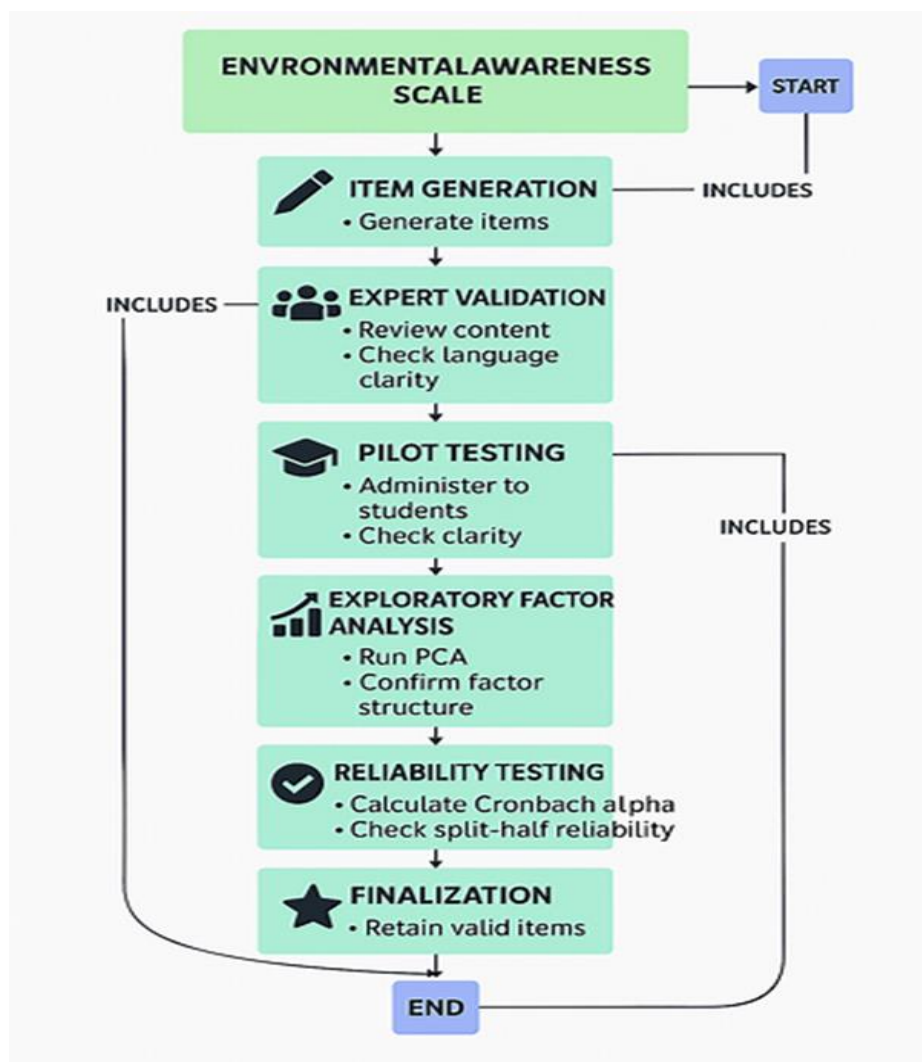


Figure 2. Flowchart of the Development Process of the EAS



X. Data Collection Procedure

The data were collected through both offline and online modes. For offline data, printed questionnaires were distributed in teacher education institutions in Dehradun. Online responses were collected using Google Forms to enhance accessibility for students in semi-urban and rural areas. Respondents were assured of confidentiality and anonymity, and participation was voluntary.

Statistical Techniques Used

The data were coded and analyzed using SPSS (Version 21). Both descriptive and inferential statistics were applied:

- Descriptive Statistics: Mean, standard deviation, frequency, and percentage distribution were used to summarize overall awareness levels.
- Inferential Statistics:
 - Independent sample t-test was used to compare awareness across gender.
 - One-way ANOVA was applied to compare awareness across locality and academic streams.
 - Effect size (Cohen's d and η^2) was computed to estimate the magnitude of differences.

Data Collection Procedure

The final version of the scale was created using Google Forms. The link was shared through the official student WhatsApp groups of the three universities (Maya Devi, Jigyasa, and ICFAI) to ensure wide reach and easy access for B.Ed. students. Participation was voluntary, and instructions regarding anonymity and confidentiality were clearly communicated.

Statistical Techniques

Descriptive statistics (mean, standard deviation) were calculated to analyze item responses. EFA and reliability analyses were conducted using SPSS Version 21 to assess the factor structure and internal consistency of the scale. Comparative analyses based on gender, locality, and stream were performed using independent samples t-tests and ANOVA, where appropriate.

- Descriptive Statistics: Used Mean and SD
- Inferential Statistics: Used t-test and ANOVA for group comparisons
- Software: SPSS v21, MS Excel

Ethical Considerations

Before collecting the data, students were briefed about the aim of the study, and their participation was kept voluntary, and no identifying information was collected through the Google Form to ensure confidentiality. Expert validation ensured the content was appropriate for the target group, and the study adhered to standard ethical research practices in educational research.



XI. Results and Discussion

Descriptive Analysis of Demographic Variables

The sample consisted of 109 B.Ed. students. Descriptive statistics for gender, locality, and academic stream are summarized below:

Table 1

The mean gender code was 1.68 (SD = 0.469), indicating a greater proportion of females.

Gender

		N	%	Valid %	Cumulative %
Valid	Male	35	32.1	32.1	32.1
	Female	74	67.9	67.9	100.0
	Total	109	100.0	100.0	

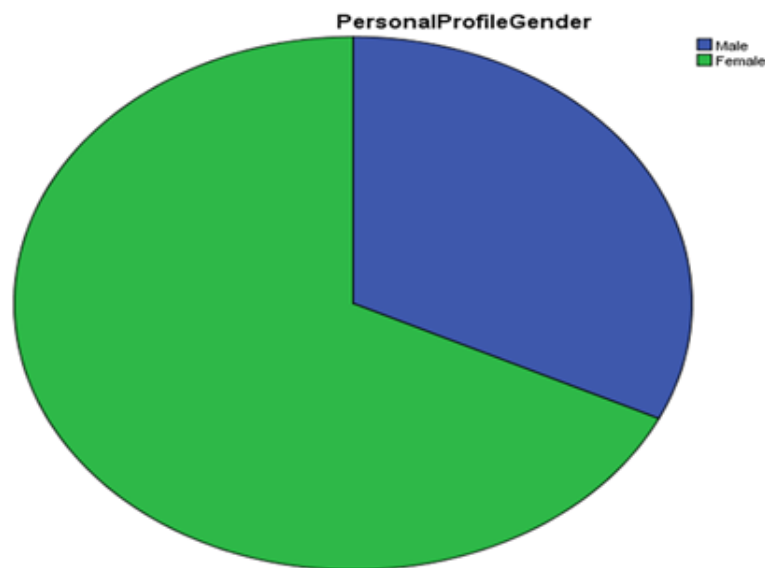


Figure 3. Pie Chart Showing Gender Distribution of Respondents

Gender:

The gender distribution indicates that 67.9% of the respondents were female while 32.1% were male. The mean gender code was 1.68 (SD = 0.469), confirming a higher representation of female B.Ed. students in the sample.

Table 2

Frequency and % Distribution of Respondents by Locality



Locality Area

Locality Area		N	%	Valid %	Cumulative %
Valid	Urban	70	64.2	64.2	64.2
	Semiurban	14	12.8	12.8	77.1
	Rural	25	22.9	22.9	100.0
	Total	109	100.0	100.0	

Locality:

70 students (64.2%) were from urban areas, 14 (12.8%) from semi-urban areas, and 25 (22.9%) from rural backgrounds.

The mean locality code was 1.59 (SD = 0.841), showing urban locality dominance.

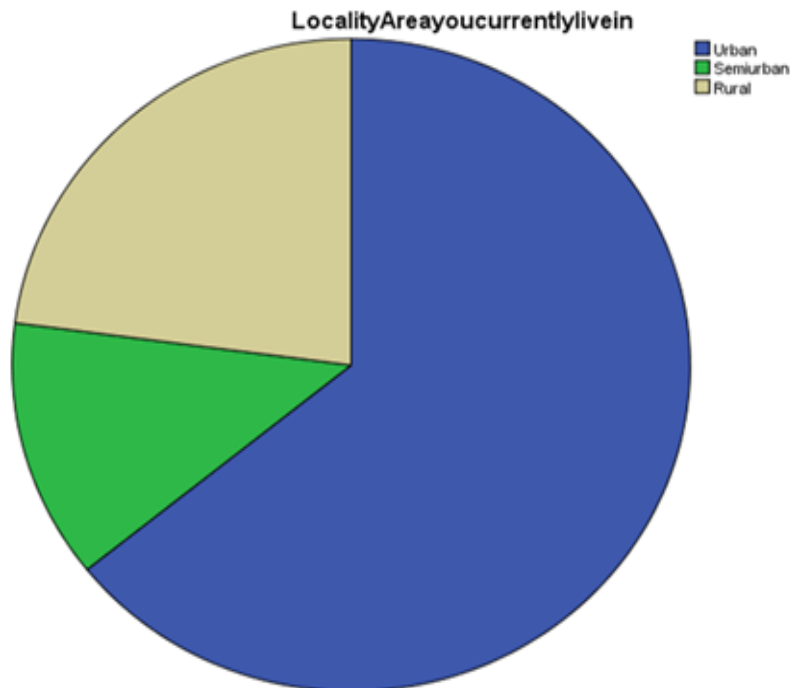


Figure 4. Pie Chart Showing Locality Distribution of Respondents

Locality:

The locality profile shows that 64.2% of respondents came from urban areas, while 12.8% were from semi-urban and 22.9% from rural backgrounds. The mean locality code was 1.59 (SD = 0.841), highlighting urban dominance in the sample.



Table 3
Frequency and % Distribution of Respondents by Academic Stream
Academic Stream

		Academic Stream			
		N	%	Valid %	Cumulative %
Valid	Science (1)	35	32.1	32.1	32.1
	Commerce (2)	31	28.4	28.4	60.6
	Arts (3)	43	39.4	39.4	100.0
	Total	109	100.0	100.0	

Academic Stream:

Three streams were represented. The distribution shows 35 students in Stream 1 (32.1%), 31 in Stream 2 (28.4%), and 43 in Stream 3 (39.4%).

The mean stream code was 2.07 (SD = 0.847).

Pie Chart

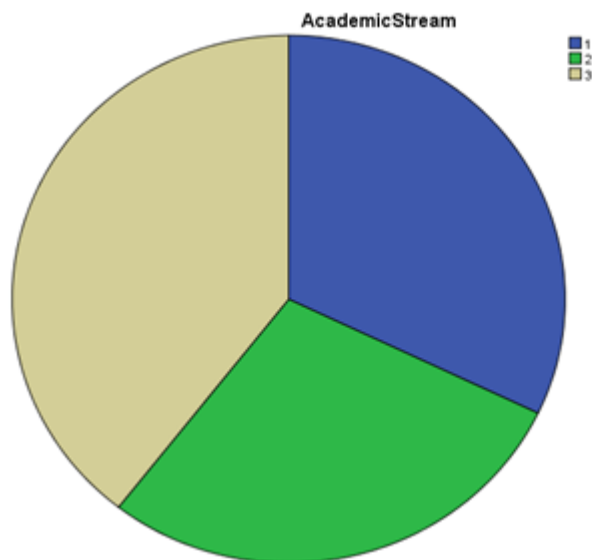


Figure 5. Pie Chart Showing Distribution of Respondents by Academic Stream



Academic Stream:

Among the three streams, Stream 1 had 32.1% of the students, Stream 2 had 28.4%, and Stream 3 was the largest group at 39.4%. The mean stream code was 2.07 (SD = 0.847).

The demographic analysis shows that the study's sample is balanced yet diverse, with a significant female majority and a strong urban representation. The distribution across streams ensures that multiple academic disciplines are reflected. This diverse composition provides a robust basis for testing the study's hypotheses on gender, locality, and academic stream differences in EA related to plant diversity and sustainable development.

Descriptive Statistics

Descriptive statistics for the total sample (N = 109) showed that the overall mean EA score was $M = 136.44$, $SD \approx 13.22$, with scores ranging from 106 to 157. For gender, male students ($n = 35$) had a mean of $M = 134.37$ ($SD = 14.49$) and female students ($n = 74$) had a mean of $M = 137.65$ ($SD = 11.66$). For locality, the groups included urban ($n = 70$), semi-urban ($n = 14$), and rural ($n = 25$), covering the same score range. For academic stream, mean scores were: Science ($n = 35$, $M = 137.46$, $SD = 12.30$); Commerce ($n = 31$, $M = 135.87$, $SD = 14.51$); Arts ($n = 43$, $M = 136.42$, $SD = 11.77$). The gender breakdown showed that 32.1% of respondents were male ($n = 35$) and 67.9% were female ($n = 74$). Regarding locality, 64.2% were from urban areas ($n = 70$), 12.8% from semi-urban ($n = 14$), and 22.9% from rural areas ($n = 25$). For academic stream, 32.1% were in science ($n = 35$), 28.4% in Commerce ($n = 31$), and 39.4% in Arts ($n = 43$). See Table 1 for frequencies.

Table 4

Variable	Category	n	%
Gender	Male	35	32.1
	Female	74	67.9
Locality	Urban	70	64.2
	Semi-Urban	14	12.8
	Rural	25	22.9
Academic Stream	Science	35	32.1
	Commerce	31	28.4
	Arts	43	39.4



Hypothesis Testing

Hypothesis 1 (H_{01})

H_{01} : There is no significant difference in the level of EA related to plant diversity and sustainable development between male and female B.Ed. students.

A t-test was conducted to compare the EA scores of male and female B.Ed. students. Levene's Test for Equality of Variances was significant, $F(1, 107) = 4.02$, $p = .047$, indicating that equal variances could not be assumed. The results showed that there was no significant difference in scores between male students ($M = 134.37$, $SD = 14.49$, $n = 35$) and female students ($M = 137.65$, $SD = 11.66$, $n = 74$); $t(55.59) = -1.17$, $p = .247$ (two-tailed). The effect size, Cohen's d , was 0.26, indicating a small effect. See Table 1.

Table 5

Gender	n	M	SD	t	df	p	Effect Size
Male	35	134.37	14.49				
Female	74	137.65	11.66	-1.17	55.59	.247	$d = 0.26$ (small)

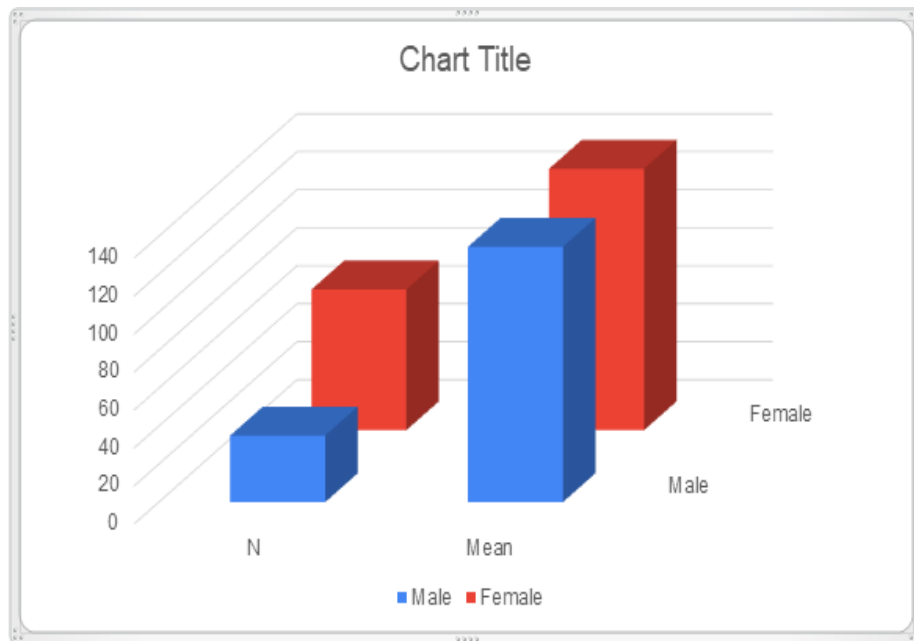


Figure 6: Comparison of EA Scores (N and Mean) between Male and Female Respondents



Hypothesis 2 (H₀₂)

H₀₂: There is no significant difference in the level of EA related to plant diversity and sustainable development among B.Ed. students from different localities (urban, semi-urban, and rural).

A one-way between-groups ANOVA was carried out to examine differences in environmental awareness (EA) scores among students belonging to urban (n = 70), semi-urban (n = 14), and rural (n = 25) backgrounds. There was no statistically significant difference in mean scores among the three groups, $F(2, 106) = 1.24$, $p = .294$. The effect size, Eta squared (η^2), was .02, indicating a small effect. See Table 2.

Table 6
One-Way ANOVA for EA by Locality (H₀₂)

Locality	n	F	df	p	Effect Size
Urban	70				
Semi-Urban	14	1.24	(2,106)	.294	$\eta^2 = .02$ (small)
Rural	25				

Hypothesis 3 (H₀₃)

H₀₃: There is no significant difference in the level of EA related to plant diversity and sustainable development among B.Ed. students from different academic streams (science, commerce, and arts).

A one-way between-groups ANOVA was carried out to examine EA scores among students from science (n = 35), commerce (n = 31), and arts (n = 43) streams. There was no statistically significant difference in mean scores among the three streams, $F(2, 106) = 0.13$, $p = .875$. The effect size, Eta squared (η^2), was .003, indicating a negligible effect. See Table 3.

Table 7

Stream	N	F	df	p	Effect Size
Science	35				
Commerce	31	0.13	(2,106)	.875	$\eta^2 = .003$ (negligible)
Arts	43				

All three null hypotheses were retained. There was no statistically significant difference in EA scores by gender, locality, or academic stream. The effect sizes were small to negligible, suggesting limited practical significance.



Hypothesis-wise Results and Conclusion

This chapter presented the detailed statistical analysis of EA among B.Ed. students, specifically related to plant diversity and sustainable development, with comparisons across gender, locality, and academic streams. The results addressed each of the study's null hypotheses using appropriate statistical tests.

Hypothesis 1 (H_{01})

Null Hypothesis: There is no significant difference in the level of EA related to plant diversity and sustainable development between male and female B.Ed. students.

- Test Used: t-test
- Result: Not significant difference ($p = .247$)
- Effect Size: Small ($d = 0.26$)
- Conclusion: The null hypothesis is retained. Gender does not significantly influence EA related to plant diversity among B.Ed. students.

Hypothesis 2 (H_{02})

Null Hypothesis: There is no significant difference in the level of EA among B.Ed. students from different localities (urban, semi-urban, rural).

- Test Used: One-way ANOVA
- Result: No statistically significant difference ($p = .294$)
- Effect Size: Small ($\eta^2 = .02$)
- Conclusion: The null hypothesis is retained. Locality does not significantly affect students' EA.

Hypothesis 3 (H_{03})

Null Hypothesis: There is no significant difference in the level of EA among B.Ed. students from different academic streams (science, commerce, arts).

- Test Used: One-way ANOVA
- Result: No statistically significant difference ($p = .875$)
- Effect Size: Negligible ($\eta^2 = .003$)
- Conclusion: The null hypothesis is retained. Academic stream does not significantly influence students' EA related to plant biodiversity.

All three hypotheses were retained, indicating that gender, locality, and academic stream do not significantly affect EA levels in the sampled B.Ed. population. Despite slight variations in mean scores, the differences were statistically non-significant. This suggests a relatively uniform baseline of awareness among future educators.

Overview of Analysis

The study employed descriptive statistics, independent-samples t-tests, and one-way ANOVAs to evaluate the hypotheses. The EAS scores indicated a moderate-to-high level of awareness across the sample (Mean = 136.44, SD = 13.22, range 106–157).

Results by Demographic Variable

- Gender: Male students ($M = 134.37$, $SD = 14.49$) and female students ($M = 137.65$, $SD = 11.66$) showed no statistically significant difference ($t(55.59) = -1.17$, $p = 0.247$, $d = 0.26$, small effect).
- Locality: Urban, semi-urban, and rural students did not differ significantly in awareness levels ($F(2,106) = 1.24$, $p = 0.294$, $\eta^2 = 0.02$, small effect).



- Academic Stream: Science, Commerce, and Arts students showed no significant differences ($F(2,106) = 0.13$, $p = 0.875$, $\eta^2 = 0.003$, negligible effect).

All three null hypotheses were retained, confirming that gender, locality, and academic stream did not significantly influence EA.

Interpretation of Findings

The absence of significant differences suggests a uniform baseline of awareness among B.Ed. students regardless of demographic background. This may reflect:

- Increased integration of environmental topics in teacher education curricula.
- Greater access to environmental information through media and institutional initiatives.
- Generic awareness that may not yet translate into deep, action-oriented ecological engagement.

Contributions of the Study

- Empirical evidence on plant diversity awareness among future educators in the Dehradun region.
- Comparative analysis across multiple demographic factors, highlighting uniformity in awareness.
- Policy-relevant insights for NEP 2020 and SDG-linked curriculum reforms in teacher education.

Link to Future Work

The results provide a baseline for more in-depth studies that assess:

- Behavioral and attitudinal shifts post-intervention.
- Longitudinal impacts of biodiversity-focused teacher training.
- Qualitative insights into perceptions of plant diversity and sustainability.

Key Conclusions

- High overall awareness: B.Ed. students generally possess strong awareness of environmental issues and plant diversity.
- No demographic influence: Gender, locality, and academic stream do not significantly affect awareness levels.
- Standardised exposure: Teacher education programmes appear to be delivering similar environmental content across all groups.
- Need for depth: Equal awareness scores do not necessarily indicate deep ecological understanding or behaviour change.

Educational Implications

- Move beyond theoretical awareness to experiential learning and local biodiversity studies.
- Focus on action competence—the skills to make and implement sustainable choices.
- Employ eco-pedagogy and constructivist methods for relevance and engagement.
- Introduce specialised biodiversity modules aligned with NEP 2020 and SDGs.



Alignment with NEP 2020

NEP Focus Area	Study Contribution
Experiential learning	Recommends biodiversity projects, eco-clubs, and outdoor studies
Multidisciplinary curriculum	Supports integration of environmental content across all streams
Environmental awareness	Identifies uniform awareness but calls for deeper engagement
Teacher preparation	Suggests sustainability-focused curriculum reforms

Alignment with SDGs

SDG	Connection with the Study
SDG 4: Quality Education	Advances environmental literacy in teacher training
SDG 13: Climate Action	Promotes understanding of ecosystems and climate links
SDG 15: Life on Land	Supports plant biodiversity conservation
SDG 12: Responsible Consumption	Fosters sustainable values and practices

Recommendations

- Curriculum Reforms: Integrate local plant biodiversity content; adopt cross-stream approaches.
- Experiential Activities: Include school gardens, plant surveys, herbarium development, eco-club drives, and biodiversity audits.
- Policy Action: Incorporate SDG-linked assessments; mandate sustainability education in teacher training.
- Community Linkages: Involve B.Ed. trainees in NSS/UBA outreach and local biodiversity campaigns.

Scope for Future Work

- Assess ecological literacy and behavioural outcomes beyond awareness scores.
- Implement and evaluate biodiversity-focused interventions.
- Expand research to other states and ecological zones.
- Conduct qualitative studies on plant diversity perceptions.
- Evaluate policy implementation of NEP 2020 environmental provisions.

Limitations

- Limited to three universities in Dehradun.
- Focused on awareness, not behaviours or skills.
- Did not include longitudinal or qualitative data.



XII. Conclusion

This study provides empirical evidence that B.Ed. students in Dehradun possess a high but uniform level of EA, irrespective of gender, locality, or academic stream. While this uniformity is promising, there is a pressing need to deepen ecological understanding and translate awareness into sustained action. By embedding rich, experiential biodiversity education into teacher training, aligned with NEP 2020 and the SDGs, teacher education can become a powerful driver of environmental sustainability and responsible citizenship. The study also contributes to the discourse on environmental education by highlighting the strengths and gaps in current awareness levels of teacher trainees. By embedding plant diversity and sustainability more deeply in teacher education, India can prepare educators who not only understand ecological challenges but also inspire future generations to take meaningful action toward environmental conservation.

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