



A Comparative Study of Environmental Attitude among B.Ed. Trainees Based on Gender

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Abstract

The present study examined whether male and female B.Ed. trainees differ in their attitude towards the environment, and whether any such difference is uniform across the facets of that attitude. A descriptive survey design was adopted. Data were collected from 300 second-semester B.Ed. trainees (150 male, 150 female) drawn through stratified random sampling from six colleges of education affiliated to Jiwaji University, Gwalior (Madhya Pradesh), during the session 2024-25. The Environmental Attitude Scale (EAS) constructed by the investigator was used; it carries 40 statements over five dimensions on a five-point Likert format, and returned a Cronbach's alpha of .93. Data were analysed through mean, standard deviation, skewness, kurtosis, the t-test for independent samples, two-way analysis of variance and Pearson's correlation. Female trainees obtained a significantly higher mean environmental attitude score than male trainees, $t(298) = 2.98$, $p = .003$, $d = 0.34$, but the difference was confined to three of the five dimensions. A significant gender by academic stream interaction, $F(1, 296) = 5.60$, $p = .019$, showed that the gap was restricted to arts-stream trainees. Implications for the environmental component of teacher education are discussed.

Keywords: environmental attitude, B.Ed. trainees, gender, teacher education, environmental education

1. Introduction

Environmental degradation has moved from the margins of public debate to its centre within a single generation. Air quality across much of northern and central India falls below permissible limits for most of the year, groundwater tables continue to decline, and municipal waste accumulates faster than it can be processed. What a society does about these conditions depends less on the sophistication of its technology than on the dispositions of the people who operate it, which is why the preparation of teachers has become a matter of environmental concern in its own right.

A trainee who leaves a college of education indifferent to environmental questions will, over a working life of three decades, teach several thousand children. Whatever the syllabus prescribes, the attitude the teacher carries into the classroom colours how environmental content is presented. Zhang et al. (2025), reviewing a decade of published work, found that textbook-bound instruction still dominates environmental teaching and that reform has depended on the individual teacher rather than on curricular provision. The attitudes of those entering the profession therefore deserve close study.

1.1 Environmental Attitude as a Construct

Attitude is a learned predisposition to respond in a consistently favourable or unfavourable manner towards a given object. Applied to the environment, it refers to the individual's evaluative orientation towards the natural world and towards human conduct affecting it. The construct is generally treated as having a cognitive, an affective and a conative component, and the distance between them is a recurring finding. Alshehri (2024) reported that knowledge acquired through formal instruction did not translate into behaviour, and Kritika and Pandey (2026) measured a significant gap between awareness and behavioural adoption within the same sample of high school students. Environmental attitude is therefore best treated as



multidimensional; a single global score conceals as much as it reveals. The present study accordingly reports both a composite score and five dimension scores.

1.2 Gender and Environmental Attitude

Among the background variables studied in this area, gender has attracted the most sustained attention. Gokmen (2021) synthesised 53 studies covering 22,103 participants and reported an effect favouring females, though a modest one ($d = 0.28$). Gyurian Nagy (2025) found that women recorded a higher ecological orientation on the New Ecological Paradigm scale while men's responses showed greater dispersion, and Bush and Clayton (2023) observed that the gender gap in climate concern widens with a country's level of economic development, which suggests a difference conditioned by social circumstance rather than a fixed trait. Explanations divide into two families. The socialisation account holds that girls are more often raised to attend to the needs of others, and that this orientation extends outward to the natural world. The ecofeminist account locates the difference in the shared structure of domination over women and over nature, and predicts that environmental concern travels with egalitarian gender attitudes rather than with sex as such. Echavarren (2023), testing both against data from 45 countries, found the ecofeminist prediction supported and the socialisation account not.

1.3 The Indian Teacher Education Context

Indian evidence is less consistent than the international literature. Sowmya and Kumar (2023) reported no significant difference between boys and girls among secondary school students in Mysore district. Zafar et al. (2024), working with prospective teachers in Lahore, found male trainees ahead on environmental knowledge while overall literacy did not differ by gender. Goel et al. (2023) documented strong familiarity with climate vocabulary among Indian schoolchildren alongside conceptual confusion about causes and consequences. The relationship therefore appears real but conditional. This matters for teacher education because the two-year B.Ed. programme is, for most entrants, the last point at which the system can address environmental dispositions before they harden into professional practice. The National Education Policy 2020 places environmental awareness among the capacities every learner is expected to develop, and NCTE programme structures make environmental education compulsory.

2. Review of Related Literature

2.1 Studies Reporting a Difference in Favour of Females

The larger body of work reports higher environmental attitude or concern among female respondents. Samur and Akman (2023) found a significant difference in favour of female social studies pre-service teachers, and Schulz et al. (2024) found male gender negatively associated with almost every one of ten pro-environmental behaviour intentions in a German sample. Boned-Gomez et al. (2025) reported female adolescents ahead across the knowledge, attitude and behaviour components of sustainability awareness, and Akay and Akcaova (2025) found female participants ahead on the behavioural sub-scale and on the full scale. Two features deserve notice: effect sizes are consistently small, so much within-gender variance remains unexplained; and the difference is usually stronger on affective than on knowledge measures.

2.2 Studies Reporting No Difference

A smaller but not negligible set of studies fails to find the difference. Sowmya and Kumar (2023) reported no significant difference among secondary school students in Mysore district, and Zafar et al. (2024) found male prospective teachers ahead on environmental knowledge with no meaningful difference in overall literacy. Ymeri et al. (2025), studying 444 undergraduates in Kosovo, did not report gender as a differentiating variable. Rodriguez Perez et al. (2024) found the depth of environmental understanding to vary considerably across dimensions within a largely female pre-service sample, which suggests that within-gender variation may be large enough to obscure between-gender comparisons in small samples.

2.3 Environmental Education and the Teacher



A third strand addresses the institutional setting. Ivorra-Catala et al. (2024) found that although teachers acknowledged the importance of environmental education, schools lacked the structures needed to deliver it, and Benzehaf et al. (2025) documented favourable attitudes among university students alongside inconsistent practice. Attitude is therefore a necessary but insufficient condition for effective environmental teaching.

2.4 Research Gap

Three gaps emerge. The first is geographical: Indian evidence on B.Ed. trainees specifically, as distinct from school students or in-service teachers, is thin, and evidence from the Gwalior-Chambal region thinner still. The second is analytical: most studies compare composite scores and stop, so it is not known whether the gender difference is spread evenly across the components of environmental attitude. The third concerns interaction: gender is normally examined in isolation, although academic background is an obvious moderating candidate in a trainee population drawn roughly equally from arts and science graduates. The present study addresses all three.

3. Significance of the Study

The findings bear on three groups. For teacher educators, dimension-wise results indicate where remedial input is needed, which is more useful than knowing that one group scores higher overall. For curriculum framers working within the NEP 2020 framework, evidence on whether academic stream conditions the gender difference bears on how the environmental component should be sequenced. For researchers, a study on an Indian trainee population adds a data point to a literature dominated by European and Turkish samples.

4. Operational Definitions

Environmental attitude refers to the total score obtained on the Environmental Attitude Scale (EAS), ranging from 40 to 200, a higher score indicating a more favourable orientation towards environmental preservation. **B.Ed. trainees** refers to students enrolled in the second semester of the two-year Bachelor of Education programme in colleges affiliated to Jiwaji University, Gwalior, during the session 2024-25. **Gender** refers to the two categories, male and female, as recorded on the personal data sheet.

5. Method

5.1 Research Design

The descriptive survey method was adopted, since the study sought to describe environmental attitude as it exists in a defined population and compare sub-groups within it. For the fourth objective a 2 x 2 factorial arrangement (gender x academic stream) was superimposed on the survey data and analysed through two-way analysis of variance.

5.2 Population and Sample

The population consisted of all B.Ed. trainees enrolled in colleges affiliated to Jiwaji University, Gwalior, during the session 2024-25. Six colleges were selected by simple random sampling, and within each college trainees were stratified by gender and drawn at random from each stratum so that the two gender groups would be of equal size. Of 312 schedules distributed, 306 were returned and six discarded for incomplete responses, leaving 300 usable cases.

Table 1: Composition of the Sample (N = 300)

Variable	Category	Male	Female	Total (%)
Gender	Male	150	—	150 (50.00)
	Female	—	150	150 (50.00)
Academic stream	Arts	78	82	160 (53.33)
	Science	72	68	140 (46.67)
Locality	Rural	78	60	138 (46.00)
	Urban	72	90	162 (54.00)
Total		150	150	300 (100.00)

Note. Percentages are calculated on the total sample. Academic stream refers to the subject group of the trainee's qualifying degree.

5.3 Tool Used

The Environmental Attitude Scale (EAS) was constructed by the investigator for use with teacher trainees. An initial pool of 68 statements was drafted after consulting the literature and interviewing eleven trainees and four teacher educators. Five experts examined the pool and 52 statements survived scrutiny; these were tried out on 90 trainees outside the final sample, and item analysis retained the 40 statements whose corrected item-total correlations exceeded .30, distributed equally over the five dimensions listed in Table 2. Each statement is answered on a five-point Likert format; favourable statements are scored 5 to 1 and the 16 unfavourable statements in reverse, giving a range of 40 to 200. The scale correlated .74 with the Environmental Awareness Ability Measure on a sub-sample of 60 trainees, which was taken as evidence of concurrent validity.

Table 2: Dimensions, Reliability and Descriptive Indices of the Environmental Attitude Scale

Dimension	Items	Cronbach's α	Mean inter-item r	M	SD
D1: Awareness of environmental problems	8	.842	.398	28.83	4.70
D2: Concern for pollution control	8	.834	.384	29.78	4.48
D3: Conservation of natural resources	8	.845	.406	29.34	4.58
D4: Attitude towards environmental education	8	.852	.417	29.35	4.75
D5: Willingness for environmental action	8	.827	.375	28.76	4.49
Full scale	40	.931	.289	146.06	17.44

Note. Dimension scores range from 8 to 40; the full-scale score from 40 to 200. The Spearman-Brown corrected split-half coefficient for the full scale was .943.

5.4 Procedure and Statistical Techniques

Permission was obtained from the principals of the six colleges, and the investigator administered the scale personally in intact classrooms between November 2024 and January 2025. Participation was voluntary, no identifying information was recorded, and most respondents finished within 25 to 30 minutes. Mean, standard deviation, median, skewness and kurtosis were computed to describe the distributions; Kolmogorov-Smirnov and Shapiro-Wilk were used to check normality and Levene's test homogeneity of variance. The t-test for independent samples was applied to the two-group comparisons with Cohen's d, two-

way analysis of variance to the factorial design with partial eta squared, Pearson's correlation among the dimensions, and chi-square to the cross-classification of gender by attitude level.

6. Analysis and Interpretation of Data

6.1 Preliminary Analysis: Distribution of Scores

Before the comparative analyses, the distribution of total scores was examined for both groups.

Table 3: Descriptive Statistics and Tests of Normality for Total Environmental Attitude Scores

Group	N	M	SD	Mdn	Skewness	Kurtosis	K-S (p)
Male	150	143.10	17.55	143.00	-0.233	0.746	.063 (.571)
Female	150	149.01	16.88	151.50	-0.211	0.043	.074 (.374)
Total	300	146.06	17.44	146.00	-0.232	0.393	.053 (.348)

Note. K-S = Kolmogorov-Smirnov statistic with Lilliefors correction. Shapiro-Wilk was also non-significant throughout (total sample: $W = .993$, $p = .165$). Standard error of skewness for the total sample = 0.141.

All skewness and kurtosis values lie within plus or minus one and neither test of normality attained significance, so the assumption of normality is tenable and parametric tests are appropriate. Figure 1 displays the two distributions with fitted normal curves.

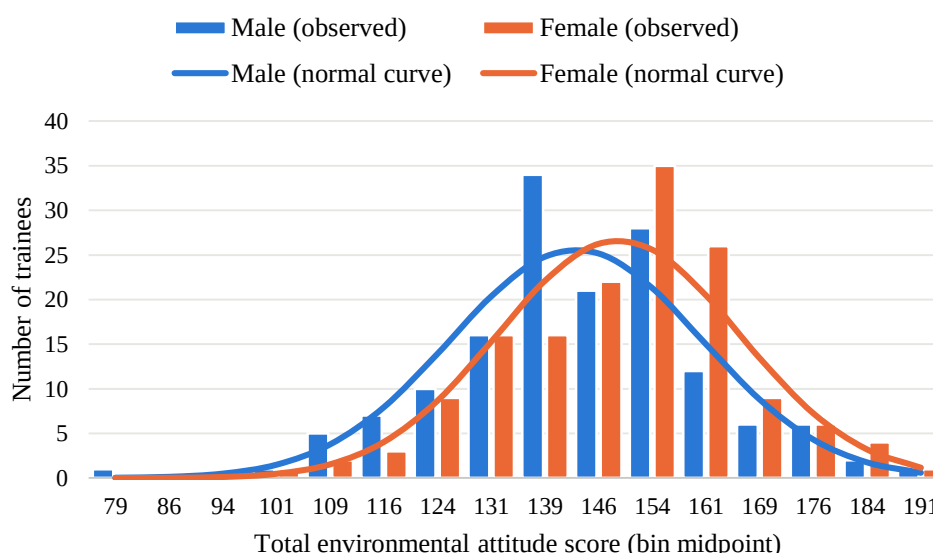


Figure 1: Distribution of total environmental attitude scores of male and female B.Ed. trainees

Note. Bin width = 7.5 score points. The dashed line marks the mean of the total sample.

6.2 Objective 1: Level of Environmental Attitude

Trainees were classified into three levels using the mean and standard deviation of the total sample: above $M + 1SD$ (163.50) as high, below $M - 1SD$ (128.62) as low, and the rest as moderate.

Table 4: Level of Environmental Attitude of B.Ed. Trainees by Gender

Level	Score range	Male (n)	Male (%)	Female (n)	Female (%)	Total (%)
High	Above 163	15	10.00	24	16.00	39 (13.00)
Moderate	129 – 163	109	72.67	108	72.00	217 (72.33)
Low	Below 129	26	17.33	18	12.00	44 (14.67)
Total		150	100.00	150	100.00	300 (100.00)

Note. Cut-off points are $M \pm 1SD$ of the total sample ($M = 146.06$, $SD = 17.44$). $\chi^2(2, N = 300) = 3.54$, $p = .171$.

Close to three-quarters of the trainees fall in the moderate band, and the two extreme categories are of similar size. The modal position is one of moderate rather than strongly favourable attitude, which is itself of consequence for a group about to teach environmental content. Female trainees are over-represented in the high category and under-represented in the low, but the chi-square test of association between gender and attitude level did not reach significance, $\chi^2(2, N = 300) = 3.54$, $p = .171$. The gender difference is thus a shift of the whole distribution rather than a redistribution across categories.

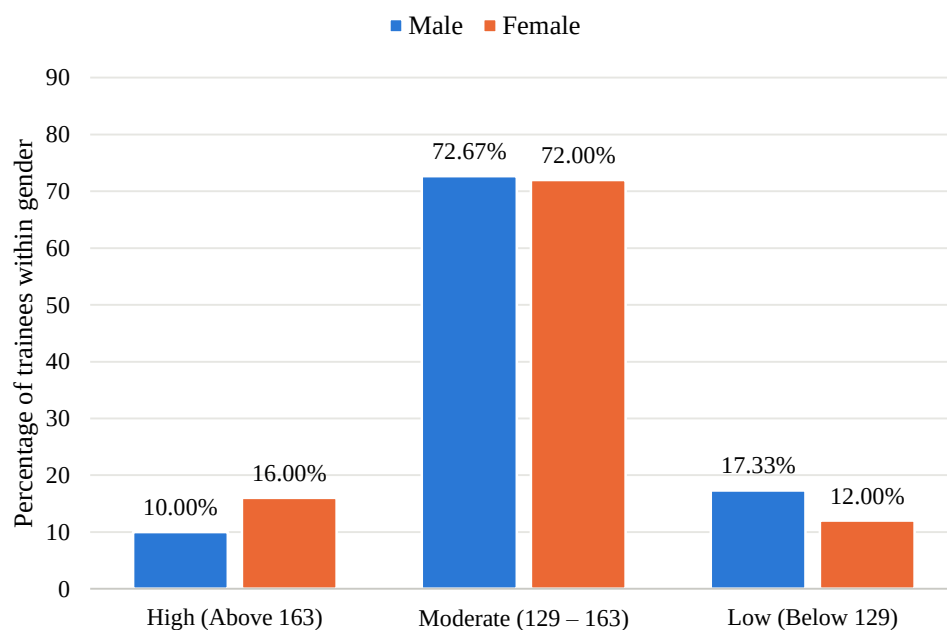


Figure 2: Percentage distribution of male and female trainees across three levels of environmental attitude
Note. Percentages are computed within each gender group ($n = 150$ each).

6.3 Objective 2 and H01: Comparison of Male and Female Trainees

Levene's test was non-significant, $F = 0.01$, $p = .920$, so equal variances were assumed. Results appear in Table 5.

Table 5: Comparison of Environmental Attitude of Male and Female B.Ed. Trainees

Group	N	M	SD	SE	df	t	p	Cohen's d
Male	150	143.10	17.55	1.43	298	2.98	.003**	0.34
Female	150	149.01	16.88	1.38				

Note. ** $p < .01$. Mean difference = 5.91, 95% CI [2.00, 9.83]. $\eta^2 = .029$.

The obtained t value of 2.98 for 298 degrees of freedom is significant at the .01 level, so H01 is rejected: female trainees hold a more favourable attitude towards the environment than their male counterparts. The mean difference of 5.91 score points corresponds to a Cohen's d of 0.34, a small to moderate effect, with a ninety-five per cent confidence interval from 2.00 to 9.83 points. The difference is reliable but not large, accounting for slightly under three per cent of the variance in total scores.

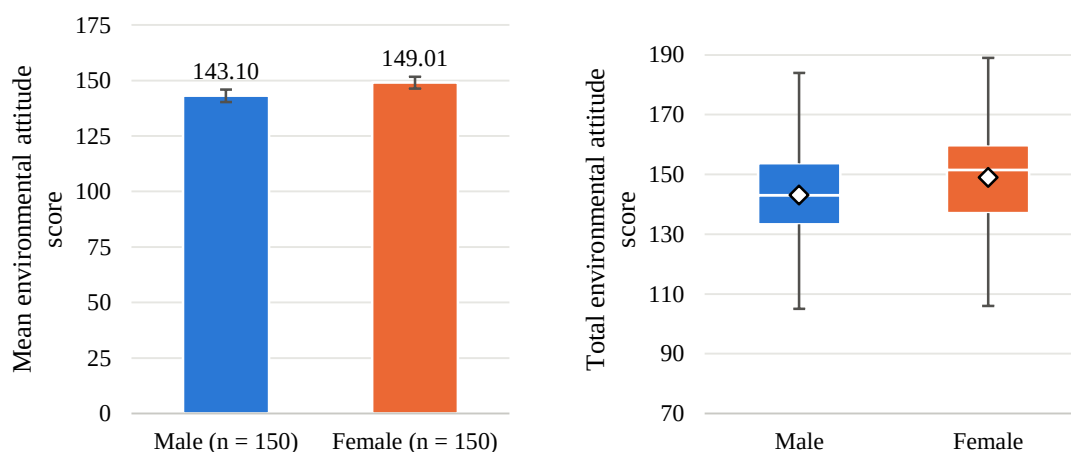


Figure 3: Comparison of male and female B.Ed. trainees on total environmental attitude score
Note. Panel (a) shows group means with 95% confidence intervals; panel (b) shows the distribution of individual scores, with the white diamond marking the arithmetic mean.

The message the means mask is clearly conveyed in panel (b): the two distributions are very much overlapped and there is a significant number of male trainees with scores higher than the median for the females. The finding applies to the group averages, not to individuals.

10.4 Objective 3 and H02 to H06: Dimension-wise Comparison

The composite finding was next decomposed, with separate t-tests for each of the five dimension scores.

Table 6: Dimension-wise Comparison of Male and Female B.Ed. Trainees

Dimension	Male (n = 150)		Female (n = 150)		t	p	Cohen's d
	M	SD	M	SD			
D1: Awareness of environmental problems	28.93	5.08	28.73	4.31	-0.37	.713	-0.04
D2: Concern for pollution control	28.81	4.21	30.75	4.54	3.85	< .001**	0.45
D3: Conservation of natural resources	28.43	4.51	30.25	4.47	3.50	.001**	0.40
D4: Attitude towards environmental education	28.32	5.06	30.37	4.19	3.83	< .001**	0.44
D5: Willingness for environmental action	28.61	4.40	28.91	4.60	0.58	.564	0.07

Note. df = 298 for all comparisons. ** p < .01. A positive t value indicates a higher mean for female trainees.

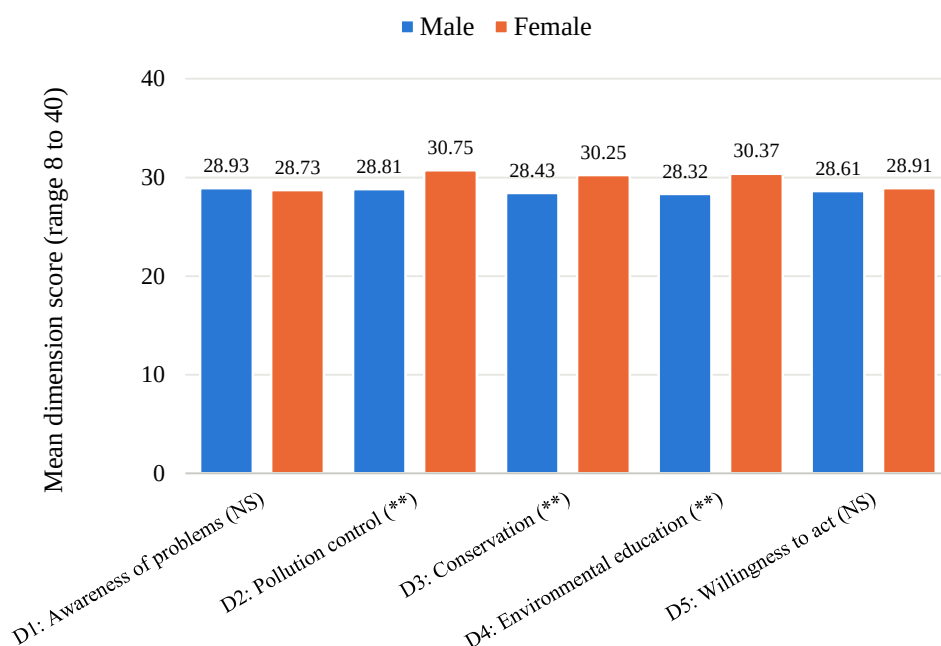


Figure 4: Dimension-wise mean environmental attitude scores of male and female trainees

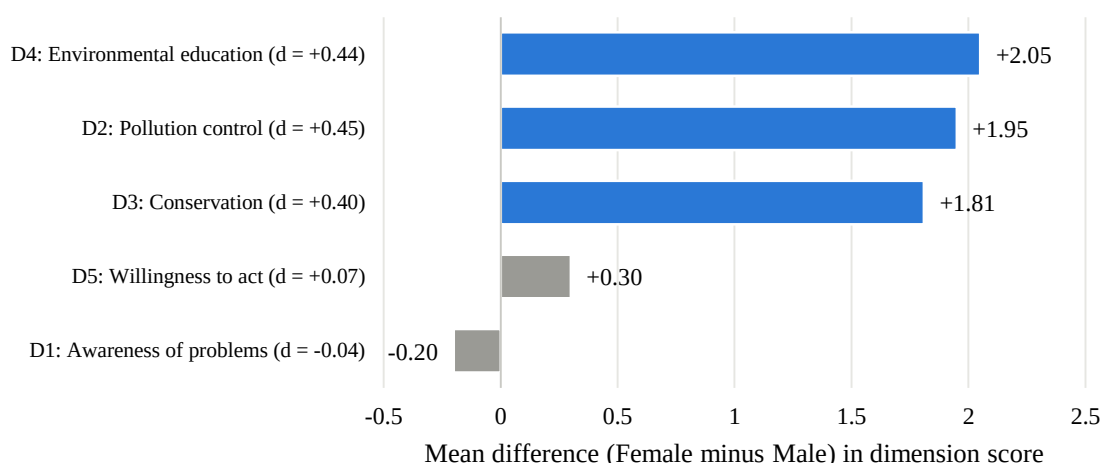


Figure 5: Magnitude and direction of the gender difference on each dimension of the scale

Most pattern is not uniform. The female trainees have significantly high scores and the three scores H03, H04 and H05 are rejected in respect of concern with pollution control, conservation of natural resources and attitude towards environmental education. Once people are aware of environmental issues and are willing to do something about it, the difference is negligible, and hence H02 and H06 are retained. For the three significant dimensions, the size of the effect is between 0.40 and 0.45, higher than for the composite score, indicating that the two null dimensions take away the effect.

It's telling how the dimensions that divide the groups. There is no difference between the two groups on the knowledge dimension of their awareness of environmental problems, and both have had the same schooling programs and have studied environmental studies papers. It is a matter of personal conduct whether one is willing for action and both groups have the lowest scores. The three factors that do

differentiate the groups have the highest evaluative loading, suggesting it is the value placed on environmental questions and not information about questions that differentiates the groups.

10.5 Objective 4 and H07: Gender and Academic Stream

A 2 x 2 analysis of variance was computed with gender and academic stream as independent variables and total score as the dependent variable.

Table 7: Cell Means and Standard Deviations for the Gender x Academic Stream Design

Gender	Arts stream			Science stream		
	n	M	SD	n	M	SD
Male	78	137.40	17.49	72	149.28	15.50
Female	82	147.78	15.73	68	150.50	18.17
Combined	160	142.72	17.42	140	149.87	16.79

Table 8: Summary of Two-way Analysis of Variance for Environmental Attitude Scores

Source of variation	SS	df	MS	F	p	η^2p
Gender (A)	4309.62	1	4309.62	15.41	< .001**	.050
Academic stream (B)	5284.38	1	5284.38	18.90	< .001**	.060
A x B (interaction)	1565.38	1	1565.38	5.60	.019*	.019
Error (within)	82768.17	296	279.62			
Corrected total	90950.04	299				

Note. Type III sums of squares were used because cell frequencies are unequal; components therefore do not add exactly to the corrected total. $p < .05$. * $p < .01$.

Both main effects are significant: female trainees scores are higher than male trainees, $F(1, 296) = 15.41$, $p < .001$, the same way, scores for trainees are higher in science-stream than in arts-stream, $F(1, 296) = 18.90$, $p < .001$. More interesting is the interaction, $F(1, 296) = 5.60$, $p = .019$, which leads to the rejection of H07. Simple effects analysis clarifies it: within the arts stream the gender difference is large, $t(158) = 3.95$, $p < .001$, $d = 0.63$, whereas within the science stream it disappears, $t(138) = 0.43$, $p = .669$, $d = 0.07$.

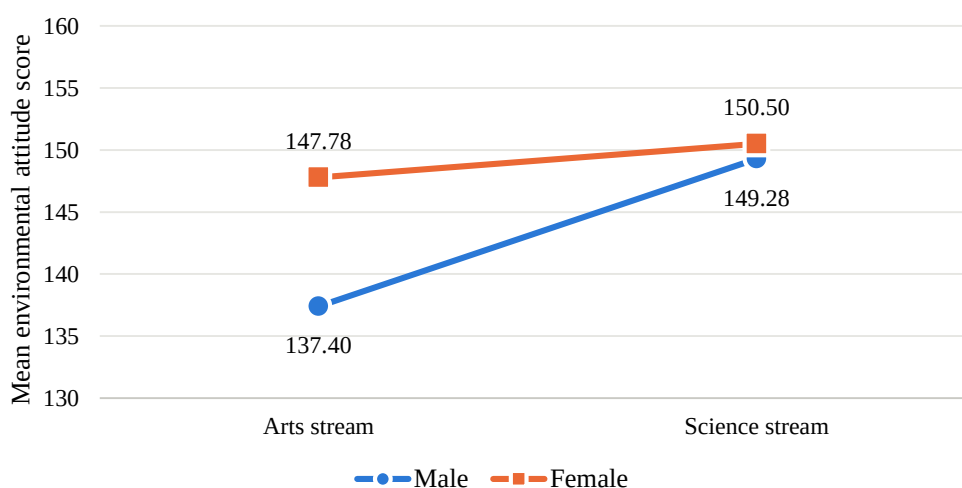


Figure 6: Interaction of gender and academic stream on mean environmental attitude scores

From the lines are clearly not parallel to one another. There is very little difference between the scores of female trainees and male trainees in both streams (2.72 points), and also between the male trainees in both

streams (11.88 points). The overall gender difference is mostly due to the arts-stream sub-sample as demonstrated in Table 5.

10.6 Objective 5 and H08: Comparison by Locality

The gender comparison was repeated separately within the rural and urban sub-samples.

Table 9: Comparison of Environmental Attitude by Gender within Locality Groups

Sub-group	Male M (SD), n	Female M (SD), n	df	t	p	d
Rural	142.81 (18.73), 78	149.27 (16.97), 60	136	2.09	.038*	0.36
Urban	143.42 (16.31), 72	148.84 (16.90), 90	160	2.06	.041*	0.33

Note. $p < .05$. * $p < .01$. A positive t value indicates a higher mean for female trainees.

It is clear that there exists a significant difference between the subsample of females and males trainees at the .05 level for both the females (0.36) and males (0.33) trainees with effect sizes close to the sample as a whole where H08 is rejected. Not locality but academic stream is a moderating variable, as the academic stream does not condition the gender difference.

10.7 Relationship among the Dimensions and Summary of Testing

Table 10: Inter-correlations among the Dimensions of the Scale (N = 300)

Dimension	D1	D2	D3	D4	D5	Total
D1: Awareness of environmental problems	—					.750
D2: Concern for pollution control	.449	—				.733
D3: Conservation of natural resources	.487	.510	—			.792
D4: Attitude towards environmental education	.499	.443	.506	—		.782
D5: Willingness for environmental action	.394	.390	.504	.500	—	.733

Note. All coefficients are significant at $p < .001$.

Dimensions are moderately intercorrelated ranging from .39 to .51 and substantially with the total score from .73 to .79. This can be used to help treat environmental attitude as a set of interrelated and separable attitudes, rather than as a unified attitude. Table 11 is a summary of the results of the eight hypotheses.

Table 11: Summary of the Testing of Null Hypotheses

Hypothesis	Statement (in brief)	Test statistic	p	Decision
H01	No gender difference in total score	$t = 2.98$	.003	Rejected
H02	No gender difference on D1	$t = -0.37$	.713	Retained
H03	No gender difference on D2	$t = 3.85$	< .001	Rejected
H04	No gender difference on D3	$t = 3.50$	.001	Rejected
H05	No gender difference on D4	$t = 3.83$	< .001	Rejected
H06	No gender difference on D5	$t = 0.58$	.564	Retained
H07	No gender x stream interaction	$F = 5.60$	.019	Rejected
H08	No gender difference within locality groups	$t = 2.09 / 2.06$	.038 / .041	Rejected

Note. For H08 the two values refer to the rural and urban sub-samples respectively.

11. Discussion

The main finding is that the female B.Ed trainees are more positive towards the environment than male trainees by 6 score points with an effect size of 0.34. The studies in the literature showed that the difference is significant, and an effect of 0.28 was obtained in favour of female. The same direction of difference was obtained by Samur and Akman (2023), Boned-Gomez et al. (2025) and Akay and Akcaova (2025). The central India study confirms an effect nearly as large as one obtained from a meta-analysis of the majority of studies in the world suggests that the effect is quite generalizable across cultural contexts.

It is a dimension-wise analysis which qualifies this agreement but not the composite figure. It is important to note that there is no difference from this perspective; both groups have received the same input in their environmental studies and information about environmental issues is passed on to both groups. However, Zafar et al. (2024) concluded the opposite: that male prospective teachers had a higher level of knowledge than female teachers, but no difference in the overall literacy. There is clearly a separation of knowledge and evaluation.

However, a lack of difference in the willingness to act is more sobering, as the scores of both group are lowest on the most important dimension for practice. The present data is an extension of this attitude-behaviour gap reported by Alshehri (2024), Benzehaf et al. (2025) and Kritika and Pandey (2026) for the group of female teacher trainees despite the advantage that the female teacher trainees have in evaluative orientation, this does not guarantee the expressed willingness to act.

The educational stream and gender has the most direct practical implication. Male trainees of the science stream perform equally as well as female trainees while male trainees of the arts stream perform over eleven points below their science peers. This does not represent a difference across the population as a whole, it is a difference in one quadrant of the population. One way to look at this is that there is a pathway into concerns about the environment in science content that is available to male trainees but not available to male trainees from the arts content, and that there may be a pathway into concerns about the environment in arts content that is available to female trainees but not available to male trainees. This reading will not be tested but fits with Bush and Clayton's (2023) argument for the gender gap being contingent upon context. Environmental instruction is about to take charge in the midst of the level analysis: a mild situation, as only 13.00 per cent of the trainees are in the high band.

12. Conclusion

The present study was designed to find out the difference between the environmental attitude of male and female trainees of B.Ed. programme. They do. The effect size for female trainees is similar to the impact size reported in the international literature (Small to Moderate) and female trainees score significantly higher on the composite measure. But this figure takes an uneven form; the difference shows up only on the three dimensions that have an evaluative value, not on the knowledge and willingness dimensions, and it shows



up in arts-stream trainees and not in science-stream trainees. The point of the practicality is that gender can't be the most helpful category of planning intervention, academic stream is more helpful in the identification of the group at risk, and dimension profile is more useful in what the group at risk needs. Apart from the comparison, one common phenomenon is that willingness, the least developed dimension among all the trainees, is a key factor in the value of EE in teacher preparation.

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