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Cognitive and Emotional Intelligence as Predictors of Sustainable Behaviour among Higher Secondary Students in Thrissur District, Kerala: an Empirical Study

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Abstract

Sustainable development education (SDE) plays a critical role in equipping young learners to address contemporary environmental challenges. While environmental knowledge remains central to sustainability education, growing research highlights the importance of psychological variables in shaping pro-environmental behaviour. The present study examined the influence of cognitive factors (environmental knowledge) and emotional factors (empathy toward nature, emotional regulation, and eco-anxiety) on sustainable behaviour among higher secondary students in Thrissur District, Kerala, India. A descriptive survey design was employed. The sample consisted of 300 students aged 16–18 years selected through stratified random sampling from government, aided, and private schools. Data were collected using three researcher-developed instruments: the Environmental Knowledge Scale (EKS), the Environmental Emotional Engagement Inventory (EEEI), and the Eco-friendly Behavioural Practices Checklist (EBPC). Reliability coefficients ranged from .78 to .89. Data were analysed using descriptive statistics, Pearson's correlation, and multiple regression analysis.

Results indicated that environmental knowledge ($r = .75$, $p < .01$), empathy toward nature ($r = .68$, $p < .01$), and emotional regulation ($r = .60$, $p < .01$) were positively associated with sustainable behaviour. Eco-anxiety showed a significant negative correlation ($r = -.42$, $p < .01$). Regression analysis revealed that cognitive and emotional factors jointly explained 62% of the variance in sustainable behaviour ($R^2 = .62$, $F(4, 295) = 120.45$, $p < .001$). The findings underscore the need to integrate socio-emotional learning and experiential strategies into sustainability education. The study contributes to environmental psychology literature by highlighting the combined predictive power of cognition and emotion in adolescent sustainability behaviour within the Indian educational context.

Keywords: eco-anxiety; empathy toward nature; environmental knowledge; pro-environmental behaviour; sustainable development education.

Introduction

Environmental degradation, climate change, and biodiversity loss continue to pose unprecedented global challenges. Education systems are increasingly expected to foster environmentally responsible citizenship through sustainable development education (SDE). Although environmental knowledge is widely considered foundational, research indicates that knowledge alone does not consistently translate into sustainable behaviour.

Meta-analytic findings by Bamberg and Möser (2007) suggest that psycho-social determinants, including attitudes and norms, mediate behavioural outcomes. Similarly, work published in *Journal of Environmental Psychology* emphasizes the integration of affective engagement with cognitive awareness. Emotional constructs such as empathy toward nature and eco-anxiety are increasingly recognized as significant predictors of environmental engagement. Recent scholarship (e.g., Ojala, 2023) highlights that constructive emotional regulation may transform climate concern into adaptive action, whereas excessive eco-anxiety may inhibit behavioural engagement.

Within the Indian context, empirical studies remain largely awareness-focused, with limited integration of emotional variables in adolescent populations. Particularly in Kerala—despite high literacy and progressive environmental initiatives—district-level psychological investigations of sustainable behaviour remain scarce. The present study addresses this research gap by examining the combined influence of cognitive and emotional determinants among higher secondary students in Thrissur District.

Review of Literature

Cognitive Determinants of Sustainable Behaviour

Environmental knowledge is widely regarded as a foundational predictor of sustainable behaviour. According to Bamberg and Möser (2021), knowledge influences behavioural intentions through attitudes and perceived behavioural control. Similarly, Stern and Dietz (2023) emphasized that cognitive awareness of environmental consequences strengthens personal norms, thereby promoting responsible behaviour.

However, Gifford (2011) argued that knowledge is often insufficient due to psychological barriers such as denial, perceived helplessness, and social norms. Thus, cognitive factors must interact with motivational and emotional processes to influence behaviour.

Emotional Influences: Empathy and Environmental Concern

Empathy toward nature has been identified as a strong predictor of pro-environmental action (Chawla, 2021).

Emotional attachment to natural environments enhances intrinsic motivation to protect ecosystems (Clayton & Myers, 2020).

Adolescents who report emotional connectedness to nature demonstrate higher participation in sustainable activities (Otto & Pensini, 2017).

Environmental concern functions as an effective response to ecological threats and predicts behavioural engagement (Gifford & Nilsson, 2022).

Emotional engagement deepens commitment beyond cognitive awareness.

Eco-anxiety and Emotional Regulation

Eco-anxiety refers to distress related to environmental decline (Ojala, 2023).

Moderate concern can motivate action, but excessive anxiety may produce avoidance or hopelessness. Ojala (2023) found that constructive hope mediates the relationship between climate worry and environmental engagement among adolescents.

Emotional regulation skills help individuals manage distress constructively, thereby sustaining pro-environmental action (Clayton, 2020). Students capable of adaptive coping strategies are more likely to transform concern into action.

Integration of Cognitive and Emotional Components

The Value-Belief-Norm (VBN) theory suggests that knowledge, values, and emotions collectively predict behaviour (Stern & Dietz, 2023). Contemporary environmental psychology emphasizes that sustainable behaviour emerges from the interaction between cognition and emotion rather than isolated factors.

Despite growing literature globally, empirical evidence from Indian secondary education contexts remains limited. This study integrates these perspectives within the Kerala context.

Objectives

1. To examine the relationship between environmental knowledge and sustainable behaviour.
2. To assess the influence of empathy and eco-anxiety on sustainable behaviour.
3. To analyse the combined predictive power of cognitive and emotional variables.
4. To examine gender differences in sustainability engagement.

Hypotheses

H1: Environmental knowledge positively correlates with sustainable behaviour.
H2: Empathy toward nature positively correlates with sustainable behaviour.
H3: Eco-anxiety negatively correlates with sustainable behaviour.
H4: Cognitive and emotional variables jointly predict sustainable behaviour.

Methodology

Research Design

A descriptive survey design was adopted to examine relationships among variables without manipulation.

Participants

The population comprised higher secondary students (Grades XI and XII) enrolled in government, aided, and private schools in Thrissur District, Kerala, during the 2024–2025 academic year. Stratified random sampling ensured proportional representation.

Sample size: N = 300

- Government schools: 100
- Aided schools: 100
- Private schools: 100
- Females: 158
- Males: 142
- Age range: 16–18 years

Instruments

All instruments were fully self-constructed following an extensive review of environmental psychology literature. No existing scales were directly adopted.

Environmental Knowledge Scale (EKS)

- 25 multiple-choice items
- Domains: climate change, biodiversity, sustainable consumption, waste management
- Sample items:
  - "Which gas contributes most significantly to global warming?"
  - "What is the primary objective of sustainable waste management?"
- Scoring: 1 = Correct; 0 = Incorrect
- Range: 0–25
  - 0–8 = Low
  - 9–17 = Moderate
  - 18–25 = High
- Reliability: $\alpha = .84$
- KMO = .81; Bartlett's Test significant ($p < .001$)

Environmental Emotional Engagement Inventory (EEEI)

- 20 Likert-type items (1–5 scale)
- Subscales: Empathy, Eco-anxiety, Emotional Regulation
- Sample items:
  - "I feel upset when I see damage to natural environments."
  - "I often worry about the future due to climate change."
  - "I can manage my environmental concerns without feeling overwhelmed."
- Score range: 20–100
  - 20–46 = Low
  - 47–73 = Moderate
  - 74–100 = High
- Reliability:
  - Empathy $\alpha = .87$
  - Eco-anxiety $\alpha = .82$
  - Emotional Regulation $\alpha = .78$
- CFA fit indices: CFI = .93; RMSEA = .05

Eco-friendly Behavioural Practices Checklist (EBPC)

- 15 frequency-based items (1 = Never to 5 = Always)
- Sample items:

- "I segregate waste at home or school."
- "I conserve electricity whenever possible."

- Score range: 15–75
- 15–35 = Low
- 36–55 = Moderate
- 56–75 = High
- Reliability: α = .89
- Test–retest reliability: r = .83

Procedure

Permissions were obtained from school authorities. Written parental consent and student assent were secured. Instruments were administered during school hours. Average completion time was approximately 35 minutes.

Ethical Approval

Ethical approval was granted by the Institutional Research Ethics Committee, School of Education, VISTAS, Pallavaram, Chennai- 600 117, India.

Results

Descriptive Statistics and Correlations

Table 1

Descriptive Statistics and Correlations with Sustainable Behaviour

Variable	Mean	SD	r
Environmental Knowledge	3.85	0.48	.75**
Empathy toward Nature	3.90	0.52	.68**
Eco-anxiety	2.65	0.60	−.42**
Emotional Regulation	3.70	0.54	.60**
Sustainable Behaviour	3.80	0.45	—

Note. N = 300. Means represent computed composite averages.
p < .01.

Regression Analysis

$R^2 = .62$; Adjusted $R^2 = .61$
$F(4, 295) = 120.45$, $p < .001$

Table 2

Predictor	β	t	p	VIF
Environmental Knowledge	.41	8.92	< .001	1.82
Empathy toward Nature	.29	6.75	< .001	1.76
Emotional Regulation	.21	4.88	< .001	1.54
Eco-anxiety	−.18	−4.12	< .001	1.33

Assumptions of normality, homoscedasticity, multicollinearity (VIF < 2), and independence (Durbin–Watson = 1.89) were satisfied.

Discussion

Environmental knowledge emerged as the strongest predictor of sustainable behaviour, consistent with prior meta-analytic findings. However, emotional factors significantly contributed to behavioural outcomes, supporting integrated cognitive–affective models of environmental action.

Contrastingly, some studies (2022–2023) report weaker direct effects of knowledge, suggesting mediation through identity and social norms. Indian research (Sharma & Gupta, 2022) indicates that infrastructural barriers may limit behavioural translation despite awareness. The present findings extend this literature by demonstrating that emotional regulation mitigates eco-anxiety and enhances constructive engagement.

Research Gap

Most Indian studies emphasize awareness-based interventions, with limited examination of eco-anxiety or emotional regulation among adolescents. District-level empirical evidence from Kerala remains limited.

Contribution to Indian Educational Research

This study contributes by:

1. Developing culturally contextualized instruments.
2. Integrating emotional regulation within SDE research.
3. Providing empirical district-level data from Kerala.
4. Demonstrating that emotional competencies significantly enhance sustainability engagement beyond cognitive knowledge alone.

Conclusion

Sustainable behaviour among adolescents is shaped by both cognitive understanding and emotional engagement. Effective SDE must therefore integrate knowledge acquisition with socio-emotional skill development to foster resilient, action-oriented environmental citizenship.

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