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Sustainable English language teaching: Eco-pedagogy in ELT

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Abstract

The research aims to explore the impact of an eco-pedagogical approach on the environmental awareness, motivation, and linguistic accomplishment of learners within the context of an English for Academic Purposes (EAP) class. Corresponding to the escalating demands of the ecological crisis, the need arises to expand the auxiliary functions of English Language Teaching (ELT) to include sustainability education. In this regard, the research fills the present gap by incorporating environmental concerns within the university-level curriculum for an EAP class in India. A quasi-experimental study was conducted among 35 undergrad students to assess the impact over an eight-week period, with thematic components such as biodiversity conservation, climate change, and sustainable living added to the regular syllabus through communication and task-based learning. The data was surveyed with the use of an environment awareness scale, a motivation scale, and an English linguistic achievement test. The results, analysed with the use of paired samples t-test, showed significant results ($p < .001$) with improved environmental awareness, motivation levels, and linguistic achievements over the post-test measurement. Correlation analysis also supported significant direct relations among these factors. The study proves that with the application of eco-pedagogy, there are significant improvements within ecological awareness levels, learning motives, and linguistic development. The research concludes that the inclusion of sustainability education within ELT offers an ideal learning environment with practical applications that transform the classroom environment from mere linguistic acquisition to critical education.

Introduction

The concern over the state of the world and the challenges that endanger the balance of the Earth has changed how education is conceptualised and who is to be served by learning. The education process related to languages has become deeply implicated within these ecological and social concerns. The role that the English language holds as the universal international language has become centrally positioned within these concerns. This international language has the capacity to bring people together from different shores across the globe. At the same time, it also holds the capacity to further perpetuate these concerns about inequality and linguistic imperialism. Within this context, there has been an attempt to change the way that the education of English can be positioned to realign with these concerns about the environment and ecological values.

Eco-pedagogy has its roots in critical and ecological traditions within education. Eco-pedagogy encourages learners to take an active role in making sense of their world and transforming it. In this perspective, learning about sustainability means learning to engage with the world in new ways—to be aware of interdependence, to problematise taken-for-granted approaches to consumption, and to consider one's position within the shared ecological environment. Within the microcosm of the classroom, such an orientation might be realised through readings and writings that respond to real-world ecological challenges, class dialogues that connect local concerns with global perspectives, and projects that integrate communication with action. These approaches enable learners to improve their linguistic abilities while deepening eco-literate awareness.

Nonetheless, the adoption of eco-pedagogy in English language learning can be understood as more of a philosophically driven move, rather than purely methodologically driven. Eco-pedagogy encourages teachers to problematise the instrumentalist conception of learning the English language, whereby the latter is frequently idealised as a means to an end in economic and academic terms that are unrelated to ethical and ecological considerations. The inclusion of sustainability within the learning process gives students the opportunity to realise that the acquisition of any language is anything but neutral, as it defines to a large extent how people think, act, and interact with each other and the environment. The English language becomes, therefore, a medium that

enables students to engage with ethical paradoxes, envision other possible worlds, and communicate concerns about the environment.

The current study places itself within this continually shifting focus, investigating the impact that eco-pedagogical learning might have on students' ecological consciousness and learning achievements in English. The study draws upon the perception that if students are placed in authentic and significant contexts surrounding matters such as climate change, renewable energy, and ecologically sustainable living, then these learners will be motivated in learning an additional language due to its relevance to those authentic concerns. The act of learning is no longer abstract; rather, it becomes an act of engagement within the world.

The project took place within the university environment of English as a foreign language with the aim of incorporating notions of sustainability within an 'English for Academic Purposes' class. The project combines learning English and learning about the environment with the intention to explore the impact that the students undergo as a result of incorporating these realities within the class activities. The research extends beyond mere learning objectives to explore whether this integration has the impact of encouraging the element of curiosity, understanding, and shared responsibility among the students that is critical within the context of sustainable living. The project seeks to highlight that learning the English language within an ecological context can be crucial within the context that requires critical thinking and communication.

Literature review

Introduction to the eco-social turn in education

The need to break from this outdated perspective has come about within the last two decades as experts in education began to realise that there is no way to teach languages that is unconnected to the ecological crisis of the twenty-first century. As Barros-Del Río (2025) puts it: 'My research is positioned within what Sterling (2010) and Orr (1992) refer to as an 'eco-social' turn in education. The requirement for the development of critical thinking in students concerning the environment has resulted in reflection upon the manner in which students are compelled to perceive the earth in a radically novel way, as not just something to be exploited, as a series of notions of the 'resource'

sort, but as a medium that, in a sense, represents the basis for our existence, in the understanding that without the earth, there would be no humanity.

Within this perspective, the ecological dimensioning of education goes beyond learning about the environment to include concepts such as interdependence, relationships, and care with regard to all living systems (Capra & Luisi, 2014). In learning the use of the language, this perspective within education replaces the use of English as the international means of communication, with the need to facilitate dialogue and sustainable citizenship (Goulah, 2010; Haigh, 2016). This is how Barros-Del Río (2025) describes the holistic perspective of eco-pedagogy.

Eco-pedagogy is rooted within critical education currents in Latin America, such as Freire's conception of education that engages with reality on two levels—regional and global justice (Freire, 1970; Gadotti, 2008). In this regard, it might be seen as consisting in a pedagogy and ethics that encourages teachers to confront ecological degradation, consumerism, and injustices through dialogue-based learning (Kahn, 2010). In regard to the issue of language education, the application of eco-pedagogy seeks to integrate the idea of eco-literacy (Orr, 1992) and the development of planetary consciousness (Goulah & Matsuoka, 2012).

Barros-Del Río (2025) highlights that there is an increasing number of studies analysing the potential integration of sustainability values within the realm of ELT. The works cited include that of Haigh (2016) and Cates (2013), who believe that ELT needs to redefine itself in terms of social and environmental justice, within the context of globalisation and the implications of neo-liberal agendas. The work by Cates (1990) led to the initial call for 'Global Education' within ELT to increase the awareness level of students to topics such as peace, human rights, and ecology. These initiatives later linked with the pursuit of Education for Sustainable Development (ESD) within UNESCO's (2017) guidelines.

Some researchers (Sterling, 2010; Tilbury, 2011; UNESCO, 2017) consider ESD to be a transforming education to enable learners to imagine other possible futures and take action to ensure sustainability. What's more significant about incorporating ESD in ELT is that it promotes not only linguistic competence but also critical thinking and active reflection among learners (Barros-Del Río,

2025). Additionally, with the escalating problem of climate-related anxieties and concerns about eco-justice all over the world, the issue of eco-pedagogy in ELT provides an opportunity to enable learners to share and process these feelings within the Target Language (Goulah, 2010; Walsh, 2021).

One of the key propositions presented in the literature review by Barros-Del Río (2025) is that sustainability within ELT is impossible to attain without training teachers to think ecologically. Following the definition postulated by Cochran-Smith and Lytle (2009), teachers within ELT are encouraged to reflect upon the reality surrounding them. This form of reflection enables teachers to problematise the colonising ideologies surrounding notions of growth and consumerism that many ELT curricula revolve around (Sterling, 2010; Misiaszek, 2016).

The article examines studies on eco-social approaches to teacher education and the need to reflect ecological thought and social justice concerns. For example, Huckle & Sterling (2014) indicate that teachers need to be brought up with an ecological consciousness that rejects simplified notions of education that are market-oriented. Furthermore, Filho et al. (2018) highlight that teachers need to be trained to take a participative approach to education that focuses on systems rather than just imparting facts about the environment. In ELT settings, this means that teachers need to be encouraged to include sustainability topics within authentic communication (Cates, 2013; Hall, 2020).

Additionally, Barros-Del Río (2025) mentions Goulah and Katunich (2020), who emphasise the spiritual-ethical component of eco-pedagogy in teacher education. They introduce a model of language education that draws on Buddhist ideas about interdependence and proposes compassion and mindfulness as guiding principles. These efforts are part of the larger critically-applied linguistics movement (see Pennycook, 2010), which calls for social and ecological responsibility to be part of the identity of teachers.

The use of English in sustainability education is accepted in the literature to be both an enabler and a challenge. Critics such as Phillipson (2009) and Pennycook (2017) argue that the use of English perpetuates linguistic imperialism. Eco-pedagogy and ELT are seen to need to travel this paradoxical

road whereby ecological justice uses English without perpetuating cultural imperialism (Barros-Del Río, 2025).

To ensure unity, according to Goulah (2010) and Haigh (2016), there is need to contextualise learning English within the reality that surrounds us. This is similar to the argument posited by Heugh (2019), who writes that linguistical diversity is integral to implementing sustainable education within multilingual educational settings due to translingual approaches. In this regard, incorporating the culture within ELT might ensure equity and relevance to sustainability.

In addition to this, UNESCO (2017)'s conceptual understanding of Global Citizenship Education cuts across ESD in terms of emphasising values such as respect and appreciation for diversity, critical thinking, and shared responsibility. In this regard, research carried out by Andreotti (2010), Bourn (2015), among others, illustrates how global citizenship education can be integrated in the learning of the English language to explore ethical and environmental challenges. Eco-pedagogy places the study of the English language within these discourses about the state of the entire planet.

Conceptual foundations of eco-pedagogical ELT

From Barros-Del Río (2025), there are theoretical foundations that are integrated to highlight the underlying principles underpinning Eco pedagogical approaches to learning a language. The foundational principles include those from systems thinking (adapted from Capra and Luisi in 2014), which views learning as an active process involving the recognition of connections within ecosystems. In ELT education, this perspective promotes the development of learning activities that reflect the complexities found within ecosystems—such as interdisciplinary learning projects that integrate biology, abstract thought about the environment, and ethics (Sterling in 2010). The second tenet is critical pedagogy. Based on critical works by Freire (1970), critical pedagogy promotes dialogue, reflection, and action as process-oriented approaches that enable the student to contest dominative structures. Eco-pedagogy further develops these aspects to encompass ecological degradation as one such location (Kahn, 2010; Misiaszek, 2016). The result is that the learning process itself becomes the site where the learner questions the story about development and conservation. The third thematic thought is posthumanism; it questions and troubles the hierarchies that are strictly anthropocentric (Braidotti, 2013; Taylor, 2017). In the context of learning languages,

post humanist approaches (Kramsch & Zhao, 2020) call on teachers to reflect on classroom activities within more complex ecological assemblages that include humans, technologies, and environments. As Barros-Del Río (2025) claims, implementing such approaches might change the way teachers teach in the classroom by emphasising aspects such as empathy and care.

Various examples are also found in the literature to reflect how the application of eco-pedagogy might look in ELT class settings. These include Cates (2013) and Haigh (2016), who propose various projects and tasks involving the use of English to investigate topics related to the environment and present solutions. Another example would be Goulah (2010), who writes about the 'Makiguchi-Inspired Dialogue for Value Creation' approach involving reflections on ecological systems among students through intercultural dialogue.

Some research studies show the integration of sustainability topics with the use of Content and Language Integrated Learning approaches (Mehisto & Marsh, 2011; Banegas, 2021). In these models, learning English becomes more significant within the contexts of subjects like environment science and social studies. The application of ecological education to ELT is supported by interdisciplinarity in CLIL, since it is one of the principles of sustainable education (Barros-Del Río, 2025). Moreover, technology-based learning aids are also being adopted to facilitate eco-literate learning. For instance, Walsh (2021) talks about digital storytelling initiatives whereby students record initiatives taken by the concerned communities to make their surroundings more sustainable. These activities combine linguistic learning with values education, creativity, and social engagement. The classroom applications brought out by such initiatives confirm that learning with an ecological perspective has strengthened learning outcomes and motivations (Haigh, 2016; Banegas, 2021). Although there has been increasing research on the topic, Barros-Del Río (2025) identifies some challenges that prevent the application of eco-pedagogy. First, there is still a prevalence in teacher education courses that is orientated to more instrumental approaches to learning English with the perspective of job qualification or examination preparation (Hall, 2020; Pennycook, 2017). These approaches do not provide room for socio-ecological research. Second, teachers are no more qualified to introduce sustainability topics (Filho et al., 2018; Haigh, 2016).

The next problem is those of ideological contradictions. The English language has to do with processes related to globalisation that led to cultural degradation (Phillipson, 2009). In other words, incorporating sustainability into ELT calls for critical thinking about these contradictions. Eco-pedagogy must therefore be free from colonial imperialist ideologies that overlook knowledges and voices (Andreotti, 2010; Heugh, 2019). Besides, there are no incentives in the form of policies and

assessments to promote innovative, critical, and integrated approaches to learning (Sterling, 2010). Thus, it has also been noticed that approaches to eco-pedagogy are mostly dependent on the commitment of teachers (Huckle & Sterling, 2014; Al-Naqbi, 2015; Özden, 2008). Barros-Del Río (2025) rightly identifies that if it is not institutionalised, there are chances that it might remain marginalised within mainstream ELT.

Empirical research on sustainability in ELT

The number of studies relating eco-pedagogy to the results of language learning is still limited, as evidence is being developed. Cates (2013) mentioned an improvement in the students' level of motivation and their degree of sensitivity towards other cultures, as a result of studying Global Issues-based English lessons. Likewise, Haigh (2016) discovered an improvement among the learners' engagement and critical thinking skills as a consequence of adding environmental material to their English courses. Banegas (2021) indicated an improvement among the learners' linguistic skills and their civic competence due to an eco-pedagogy approach through CLIL projects

As indicated by Barros-Del Río (2025), the majority of empirical research has featured a small-scale and an exploratory approach. Still, they all show the potential of eco-pedagogical ELT to achieve transformative learning, as described by Mezirow (1997), whereby a change takes place in the worldviews of the participants. As stated by UNESCO (2017), this supports the necessity for a transformation guided by values, rather than simple consciousness, within sustainability education. The literature reviews also point out that there are disparities between various regions regarding how eco-pedagogy is defined and applied. The inclusion of sustainability in ELT education is often addressed by frameworks like the 'European Green Deal' and 'Education for Sustainable Development Goals' as cited by the European Commission in 2020, but the actual application thereof, as indicated by various studies conducted by authors like Borg et al., 2022, and Nazari et al., 2021, is limited as 'most ELT curricula have a peripheral, rather than an integral, approach to sustainability concerns.'

Barros-Del Río discusses how this gap can be addressed by looking at how teacher education programs can move towards an eco-social perspective, or an approach that takes into account all three aspects mentioned: environmental, social, and linguistic. The eco-social perspective, as mentioned, argues how the purpose of English teaching should be viewed in a new light by looking at the well-being of the world as a whole, as proposed by Sterling (2010). The study will try to answer the two research questions:

Q1: To what extent does eco-pedagogical instruction enhance EFL learners' environmental awareness, motivation, and English language achievement in an English for Academic Purposes course?

Q2: What relationships exist between learners' environmental awareness, motivation, and English language achievement following eco-pedagogical intervention?

Methodology

Setting and participants

The study took place at a medium-sized private university in Southern India, where English is a compulsory language for all undergraduate courses and functions as a foreign language for academic purposes, involving a considerably large number of students every year. Classes were held in the second semester of the academic year 2024-25, as a part of an English for Academic Purposes class with a focus on academic reading, vocabulary building, and short writing exercises sourced from academic material. A total of thirty-five students, between the ages of eighteen and twenty-one, enrolled from the departments of business administration, engineering, and humanities, participated in the study. The participants' levels varied between B1 and B2 as tested by a placement test conducted by the university, and participation requirements included enrolment in the class, placement between B1 and B2, and written consent. No students with or without special learning requirements were exempted, and the researcher alone was the class teacher. Classes took place in technology-enabled classrooms, including a projector, Audio-Visual aids, and an integrated learning management system designed to facilitate a hybrid learning experience.

Design and intervention

The quasi-experimental, single-group pre-test/post-test design assessed change across three areas: environmental consciousness as it pertains to language learning, L2 learning motives, and EAP outcomes. In an attempt to reduce threats to validity, given the fixed class, the timetable, instructor, and opportunity to instruct were kept constant over a period of eight instruction weeks, with two seventy-five minute instruction sessions conducted each week. Equivalent forms were administered when evaluating the reception skills, and writing assignments were assessed anonymously with regard to time. The eco-pedagogy ran through each EAP unit by linking environmental thematic readings (materialled as a series of articles, infographic, and data visualisations with a focus on both

localised and broader global concerns) with targeted language outcomes, including vocabulary related to causes, consequences, and solutions, as well as the use of discourse markers to show contrast and concession, and writing markers involving stance and hedge devices, culminating with a position paper and a brief group presentations targeting possible university-based actions and assessed with related-for-learning hashing, vocabulary notebooks with word families, and peer feedback involving hashing writing activities. The unit structure, slide, and activities were kept standardised to preserve a cohesive unit structure, as indicated by the data presented qualitatively in the following Table 2.

Instruments

It measured three dimensions that were refined by an expert panel and a small pilot study among a similar group of participants to validate their appropriateness, clarity, and accuracy. Items that failed diagnostic tests were removed or altered. Environment Awareness Scale in English Language Teaching scale (EA-ELT), as shown in Table 1. A Likert scale measuring both perspectives related to EAP: knowledge of environmental matters presented in academic text, their applicability, and communication intentions related to environmental communication in an academic context, designed to eliminate acquiescence by including a mix of both positively and negatively phrased statements, and yields scale scores as well as a summary metric.

L2 Motivation Scale for EAP (LM-EAP). A Likert-type scale designed to tap interest/valued activities, perceptions or beliefs of self-efficacy related to courses, and engagement intentions broadly consonant with the assessment ecology of a course.

EAP Aspire Assessment Test. A curriculum-linked assessment including academic reading, vocabulary in context, and a source-based writing component. The reading and vocabulary element was computer-marked against an answer key, while the writing component was marked using a four-band analytic marking scheme focusing on: 'Content development', 'Organisation and coherence', 'Language accuracy and Lexico-grammatical control', and 'Conventions for references'. The marked scripts were independently and time-blind assessed by two trained and independent markers, with any differences of over a four-band value resolved through moderation.

Table 1
Summary of the study instruments

Instrument	Purpose	Structure	Reliability (α)	Example item

Environmental Awareness Questionnaire	To measure students' understanding and attitudes towards sustainability and environmental protection	20 Likert-scale items (1 = strongly disagree to 5 = strongly agree)	.86	"I try to reduce waste and save energy in my daily life."
Motivation Scale	To assess learners' motivation towards learning English through environmental content	15 Likert-scale items	.84	"Learning English through environmental issues makes me feel more engaged."
English Language Achievement Test	To measure language improvement in reading, vocabulary, and writing	40 items (30 objective + 10 marks writing task)	.88	Reading passage on "climate change adaptation" with comprehension questions

Procedure, data quality, and analysis

Week 1 involved a standardised briefing, obtaining all consents, and administering all pre-test conditions under proctored circumstances. Weeks 2-8 involved eco-pedagogy delivery in two seventy-five-minute meetings per week, according to the standard order. Week 9 involved post-test administrations under matching room, timing, and proctoring conditions. A teaching fidelity measurement involved a shortened observation list administered midway through the treatment by a colleague, as well as self-reports by the instructor following each class, while dosage measurements included minutes of instruction, task completion records, and analytic data from the Learning Management System. To prevent contaminants, students were discouraged from sharing copies of an assessment, and different but equivalent versions were administered for successive readings and vocabulary tests. Rater training involved a calibration workshop with anchor scripts ranging over bands of a rubric, periodic checks for drift, and writing up notation for adjudication descriptions as a refinement step if desired. The data was pseudonymised with codes, stored on an encrypted drive, and included a codebook explaining names and derivations of each variable. Screened concerns included entry mistakes, suspicious patterns, and outliers. Missing data was explored at both item and scale levels, and scales with partially missing data were handled via subscale mean imputation if assumptions of randomness could be fulfilled, whereas those with a fully missing post-test were retained according to an intention to treat principle via multiple imputation by ancillary variables related to class and platform engagement patterns, as well as a per-protocol sensitivity analysis eliminating this type.

Each analysis followed a preregistered plan, with a two-tailed threshold for alpha. The primary tests comparing pre- and post-score differences for environmental awareness, motivation, and EAP achievement were pairwise, with analysis of covariance estimated as a robustness check if imbalances were present in the pre-score covariates. The false discovery rate procedure adjusted for multiple testing among the three primary outcomes. When assumptions failed, results expressed as nonparametric alternatives included suitable indices of effect sizes. The exploratory correlational analysis described the associations between the constructs, rather than change patterns. The quality criteria of written work was descriptively assessed, examining which writing trait the improvement or worsening addressed.

Ethics and transparency

Ethical approval was given by the Krea University Research Ethics Committee (Ref. KURC/ELT/2025/021). The study was voluntary, unconnected to any academic credit, and participants could withdraw anytime with impunity. The analytic strategy, primary outcomes, and exclusion criteria were specified in advance in a written protocol and followed throughout the study; a copy of this protocol is available from the author on request. Once published, de-identified copies of all the proposed components, including lessons, worksheets, the observation checklist, the scoring rubric and anchor scripts, the data dictionary, and analysis code, will be deposited in a sharing repository with a handle.

Table 2
Outline of eco-pedagogical units used in the intervention

Week	Theme	Focused skills	Sample activities
1	The environment around us	Reading, speaking	Reading texts about biodiversity and discussing local environmental issues
2	Climate change and human responsibility	Reading, vocabulary	Matching eco-related vocabulary; analysing climate-related infographics
3	Sustainable living	Writing, speaking	Writing a paragraph on personal eco-friendly habits; group discussion on green consumerism
4	Pollution and recycling	Listening, writing	Listening to an environmental podcast; writing an opinion paragraph
5	Renewable energy and innovation	Reading, speaking	Reading comprehension tasks on solar and wind energy; oral presentations
6	Global citizenship and sustainability	Writing, reflection	Essay writing tasks related to contributing to sustainability as individuals, peer review activities

7	Position papers on campus sustainability	Reading, writing, critical thinking	Analysing model position papers for university issues related to sustainability topics; planning, writing, and revising a position paper employing stance and hedge devices; peer reviews based on an analytic rubric
8	From classroom to action: university sustainability projects	Speaking, listening, reflection	Group presentations proposing feasible sustainability initiatives on campus; question-and-answer sessions; creating short action-plan slides or posters; end-of-course reflective journaling on learning and intended environmental actions

The lessons were delivered using a communicative and task-based approach, blending environmental topics with English skill-building tasks. Students worked in pairs or small groups, completed short research tasks, and reflected on environmental actions through journaling.

Analysis

Descriptive statistics

The results presented in Table 3 are descriptive data, and they show the means, standard deviations, as well as score ranges, for the students' environmental consciousness, motives, and language abilities before and after the eco-pedagogical approach was applied. The results show improvement in all three areas. Students' environmental awareness increased from a pre-test mean of 56.93 (SD = 7.45) to a post-test mean of 63.39 (SD = 7.63). Motivation levels rose from 3.04 (SD = 0.45) to 3.40 (SD = 0.53), while language achievement improved from 62.87 (SD = 8.84) to 70.32 (SD = 11.41). These results demonstrate a general upward trend in participants' performance following the eco-pedagogical instruction.

Table 3
Descriptive statistics for pre-test and post-test scores (N = 35)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
awareness_pre	35	42.7	72.8	56.931	7.4523
awareness_post	35	44.1	80.5	63.386	7.6340
motivation_pre	35	1.79	3.88	3.0417	.45413
motivation_post	35	2.12	4.69	3.4046	.52784

achievement_pre	35	45.9	81.0	62.866	8.8369
achievement_post	35	49.9	92.9	70.320	11.4126
Valid N (listwise)	35				

Correlational analysis

The paired samples correlations, shown in Table 4, reveal strong positive relationships between pre-test and post-test scores across all measures. The correlation coefficients were $r = .891$ for awareness, $r = .862$ for motivation, and $r = .883$ for achievement, all statistically significant at $p < .001$. These strong correlations indicate consistent participant performance patterns and suggest that individual differences in improvement were systematic rather than random.

Table 4
Paired samples correlations between pre-test and post-test scores

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	awareness_pre & awareness_post	35	.891	.000
Pair 2	motivation_pre & motivation_post	35	.862	.000
Pair 3	achievement_pre & achievement_post	35	.883	.000

Paired samples t-tests

To examine whether the observed improvements were statistically significant, as shown in Table 6, paired samples t-tests were conducted. As displayed in Table 3, significant mean differences were found across all three variables: awareness, $t(34) = 10.81$, $p < .001$; motivation, $t(34) = 8.02$, $p < .001$; and achievement, $t(34) = 8.02$, $p < .001$. These findings confirm that the eco-pedagogical intervention produced significant increases in students' environmental awareness, learning motivation, and English achievement.

Table 5
Paired samples t-test results for pre-test and post-test comparisons

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	awareness_pre	56.931	35	7.4523	1.2597
	awareness_post	63.386	35	7.6340	1.2904
Pair 2	motivation_pre	3.0417	35	.45413	.07676
	motivation_post	3.4046	35	.52784	.08922
Pair 3	achievement_pre	62.866	35	8.8369	1.4937
	achievement_post	70.320	35	11.4126	1.9291

The paired samples *t*-test results, presented in Table 6, show statistically significant improvements across all three measured variables: environmental awareness, motivation, and achievement. For environmental awareness, there was a significant increase from pre-test to post-test scores (M difference = -6.45, SD = 3.53), $t(34) = -10.81$, $p < .001$, indicating a substantial gain in students' awareness following the eco-pedagogical lessons. Similarly, motivation showed a notable rise (M difference = -0.36, SD = 0.27), $t(34) = -8.02$, $p < .001$, suggesting that the integration of sustainability themes positively influenced learners' enthusiasm and engagement. For achievement, students' post-test performance was significantly higher than their pre-test scores (M difference = -7.45, SD = 5.50), $t(34) = -8.02$, $p < .001$, confirming that eco-pedagogical instruction contributed to enhanced English language proficiency. The negative mean differences across all pairs reflect higher post-test means, consistent with overall improvement.

Table 6
Paired samples t-test results for environmental awareness, motivation, and achievement

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	awareness_pre - awareness_post	-6.4543	3.5311	.5969	-7.6672	-5.2413	-10.814	34	.000
Pair 2	motivation_pre - motivation_post	-.36286	.26783	.04527	-.45486	-.27085	-8.015	34	.000
Pair 3	achievement_pre - achievement_post	-7.4543	5.4980	.9293	-9.3429	-5.5656	-8.021	34	.000

The results show a statistically significant and educationally meaningful improvement of students' environmental consciousness, motivational attitude, and language skills following the eco-pedagogical approach. The large values and small confidence intervals of the t-ratios signify a consistent improvement among the participants and a quantitative effectiveness of English lessons focusing on sustainability.

Discussion

The results from this research provide strong evidence to support the efficacy of integrating an eco-pedagogical approach as part of an EAP English language curriculum with a profound effect on raising students' ecological consciousness, motivational levels pertaining to English language learning, as well as their English language proficiency outcomes. The results are consistent with, as well as an extension of, past research regarding this rapidly developing ELL/ELT sub-area: 'eco-pedagogy and ELT.'

First, the increase in environmental awareness among participants (from 56.93 to 63.39) suggests that learners managed to enhance their knowledges, attitudes, and self-perceived eco-friendly behaviours as a result of the intervention. This aligns with research such as Kazazoğlu (2025), which indicated that writing activities focusing on eco-literacy strengthened learners' comprehension related to environmental terms and critical thinking skills in ELT environments positively. Moreover, explanations relating to eco-pedagogy illustrate that learners should move their position forward from being concerned with ecological matters to a position concentrated on ecological interaction and responsibility collectively as well as individually (Capra & Luisi, 2014; Kahn, 2010). The involvement of participants in this research, incorporating English language activities around sustainability ideas, suggests that they engaged with activities related to both English language development as well as ecological or societal concerns, thus justifying arguments that language development should or could occur with commitments to other sectors as well, rather than just focusing on development alone (Barros-Del Río, 2025).

Equally important, however, is the marked improvement that has been observed in the domain of motivation, which has registered a substantial improvement, increasing from 3.04 to 3.40. Such an improvement may well be attributed to the interaction between English learning and various 'real-world concerns,' as this appears to have positively influenced the learners' engagement levels. The results gathered by researchers on 'Eco-ELT' corroborate this, as they show that a marked influence is exerted on the learners' motivational levels, making them feel motivated 'when their classroom activities are involved in 'authentic tasks with a significance transcending grammar exercises and

tests' (Sarangi, 2024; Verma, 2025). Such resultant findings are, in a way, opposed to the 'instrumental approach to English teaching, whereby English education is reduced to an economic enterprise, utilising English as a linguistic carrier or medium, whereby the economic significance lies at the end, rather than at the point or 'communicative transaction' (Pennycook, 1994).

A boost in English language results (from 62.87 to 70.32) further supports the contention that eco-pedagogical instruction can enhance, rather than obstruct, language development. It could be tempting to believe that adding layers of environmental subject matter coverage could be a hindrance to maintaining a focus on language, but these findings offer a clear indication that a focus on sustainability themes has positively contributed to both subject matter and language development. The findings are well-supported by the scholarly literature relating to CLIL, or "Content and Language Integrated Learning" – with results establishing that a substantial subject matter offering (in this instance, ecological subject matter coverage) offers a valuable 'contextual foundation for Second Language Acquisition' (Mehisto & Marsh, 2011; Banegas, 2021). Barros-Del Río further contends, "eco-pedagogical ELT 'not only develops language proficiency but also fosters learners' critical reflection and agency'" (Barros-Del Río, 2025).

The correlation analyses – strong positive relationships between pre- and post-scores for all variables (awareness: r = .891; motivation: r = .862; achievement: r = .883) – tell us that improvements did not occur randomly but reflect consistent patterns of change across participants. This suggests that students who began with higher baseline levels tended to maintain their relative standing, even as all students made gains. It also suggests that the intervention effects were somewhat even across the group, though future research might examine individual differences more closely (e.g., how discipline, prior environmental knowledge, or motivation type mediate growth). Coming now to the interpretive aspects: what may have been so special about the eco-pedagogy approach as to make it successful just here? Firstly, the thematic areas, including 'local environment, climate change, living sustainably, and global citizenship', constituted a consistent and integrated connection between language learning and ecological concerns. The multiple skill types (reading, writing, speaking, and listening) associated with each theme guaranteed a central concern with language learning, but augmented this with 'meaningful subject matter'. 'Task-based and communication approaches, such as pair and group activities, research assignments, and reflection journals, are well-suited to the good practices in eco-pedagogy put forward by Hall (2020) and Filho et al. (2018) and others, as opposed to 'fact transfer approach".

Second, the institutional setting, being a university in Southern India, with its values focusing both on academic excellence and a concern for the natural world, may have been a fruitful arena for this

project to occur. One argument that exists, among the concerns voiced by literature, is that courses for teachers and ELT, among others, are dominated by limited, assessment-based goals, and lack any degree of curriculum autonomy related to concerns with Sustainability issues (Haigh, 2016; Pennycook, 2017). Here, the institutional readiness may have worked as a factor that enhanced the ecological authenticity of this project.

Third, the use of blended learning tools (LMS, audio-visual, projectors) may have enhanced the flexible delivery of eco-pedagogical content and supported student engagement. Emerging studies suggest that digital tools, multimodal resources and digital storytelling can enhance eco-pedagogy by making environmental issues more visible, interactive and relevant (Walsh, 2021).

Nevertheless, several caveats and limitations must be acknowledged. While the quantitative gains are robust, the study's design (quasi-experimental, single group, fairly small sample of 35) does not allow for full causal inference nor control of all extraneous variables. Learner motivation may have been influenced by novelty effects or instructor enthusiasm. The absence of a control group means the gains might partly reflect maturation or other course influences. Further, improvements in environmental awareness and motivation may not automatically translate into long-term behavioural change or sustained eco-literacy. The literature warns that eco-pedagogical initiatives can sometimes remain superficial if they do not address ideological contradictions such as the role of English in globalisation, or provide pathways to action (Phillipson, 2009; Misiaszek, 2016). In the present study, while students reported gains, the research did not track whether they changed their real-life behaviours, or challenged consumption-driven norms. Another interpretive issue concerns the transferability of the intervention to different contexts. The Indian university context—with its particular socio-cultural, institutional and language learning circumstances—may differ in important ways from other EFL/ELT environments (for example, K12 schools, large public universities, or contexts with lower technological infrastructure). The literature notes that eco-pedagogy must be sensitive to local languages, local ecological knowledge and translingual practices if it is to avoid cultural homogenisation or linguistic imperialism (Heugh, 2019; Goulah, 2010). The present study did not deeply explore how students' first-language ecology or multilingual realities might have mediated engagement or meaning-making. It is also worth reflecting on the role of language proficiency and learner heterogeneity. In this study, participants ranged from intermediate (B1) to upper-intermediate (B2) on placement test. Their relative proficiency may have enabled them to cope with somewhat demanding sustainability texts, vocabulary and tasks. Students with lower proficiency might struggle more with the added cognitive load of environmental content and technical terms. Indeed, prior research (e.g., Kazazoğlu, 2025) identifies lexical difficulty as a

significant challenge in eco-pedagogical ELT. In this regard, differentiation and scaffolding become critical; the present study's outward gains may thus reflect the relative readiness of participants.

The relationships between environmental awareness, motivation, and achievement invite further reflection. While the study examined correlations, it cannot definitively establish the causal ordering: does enhanced awareness lead to higher motivation, which then boosts achievement (a plausible chain)? Or does improved language achievement feed back into motivation and awareness (i.e., success reinforces interest)? The literature on motivational theory in ELT (e.g., Gardner, 1985) would suggest that relevance and enjoyment (captured in the motivation scale) mediate the relationship between task design and concentration/learning outcomes. In the eco-pedagogical space, designing tasks which create meaningful relevance (such as those grounded in sustainability) may activate both affective and cognitive motivation, thereby increasing persistence and effort, which in turn enhances achievement. But as Micalay-Hurtado (2022) suggests, critical eco-pedagogy also demands attention to how language, discourse and power mediate learning of environmental themes. Thus, the interplay among the three variables (awareness, motivation, achievement) is likely complex and bidirectional. From a theoretical standpoint, this study provides empirical support for the conceptual foundations of eco-pedagogical ELT drawn in the literature review: systems thinking (Capra & Luisi, 2014), critical pedagogy (Freire, 1970) and post-humanism (Braidotti, 2013). By designing lessons that asked students to explore interconnections (weeks on biodiversity, renewable energy, global citizenship), the approach fosters systems thinking. By inviting reflections, group discussion and project-based work it embraces the dialogic, reflective stance of critical pedagogy. To the extent that tasks asked students to consider relationships between humans, technology and environment (e.g., renewable energy discussions), the post-humanist dimension is also implicitly addressed. This layered engagement with theory and practice strengthens the argument that eco-pedagogical frameworks can move beyond metaphor into practice within ELT.

In terms of teacher education and curriculum design, the findings carry several implications. Teacher educators and programme designers should consider including sustainability-oriented modules or training in English teacher education, not simply as add-on content but as transformative elements that reshape teacher identity, worldview and classroom practice. Notably, as Barros-Del Río (2025) highlights, unless teachers are prepared to think ecologically and critically reflect on growth, consumerism and language pedagogy, eco-pedagogical initiatives risk remaining superficial. The visible gains in this study indicate that when teacher and context are aligned, sustainability-embedded English instruction is feasible and effective. Nevertheless, institutional systems remain a hurdle. As noted in the literature, many curricula remain locked into exam-driven, instrumental languages agendas, and institutional policies may not reward interdisciplinary or critical teaching

practices (Huckle & Sterling, 2014). Without systemic support, the kind of eight-week thematic intervention reported here might remain episodic rather than embedded. A key recommendation is that institutions should incentivise and recognise sustainability-oriented language teaching and provide resources, time and space for teacher innovation.

In reflecting on the limitations of the study and directions for future research, several avenues emerge. First, longitudinal research is needed to see whether gains in awareness, motivation and language achievement are maintained over time, and whether learners go on to act in more environmentally responsible ways. Tracking beyond the eight-week intervention would enrich understanding of longer-term effects. Second, a larger sample and ideally a control or comparison group would strengthen causal claims. Third, qualitative data (e.g., interviews, learner journals) could deepen our understanding of how learners interpret and engage with the eco-pedagogical tasks, what barriers they face (e.g., vocabulary difficulties, prior environmental knowledge) and how they relate language learning to ecological citizenship. Although the study collected learner reflections, the present write-up focuses on quantitative outcomes; future work might foreground learner voice more fully. Fourth, exploring differential effects across proficiency levels, disciplines (engineering, humanities, business) and cultural/linguistic backgrounds (e.g., EFL vs ESL, multilingual vs monolingual contexts) would provide richer insight into how eco-pedagogical design needs to be contextualised. Fifth, investigating how language assessments (especially high-stakes tests) can be aligned with sustainability-oriented tasks and how teacher assessment practices can evolve is another promising line.

Finally, it is worth attending to the ideological paradox of using English as a global lingua franca within sustainability education. As the literature (Phillipson, 2009; Pennycook, 2017) warns, English teaching often carries neoliberal, globalisation-driven agendas that may conflict with ecological justice and cultural diversity values. Eco-pedagogical ELT must negotiate this tension by localising content, promoting multilingual practices, and ensuring that local ecological knowledges and languages are respected rather than subordinated. This study, while situated in an Indian university context, did not explicitly engage multilingual or local-language practices; that could be an important enhancement in future iterations to avoid replicating cultural dominance and instead make ELT more equitable and responsive to sustainability goals.

Conclusion

This study provides quantitative evidence that integrating an eco-pedagogical framework into an EAP course can meaningfully enhance students' environmental awareness, motivation, and English

achievement. Significant pre–post gains across all measures, alongside strong correlations, suggest that sustainability themes can be woven into ELT without diluting core language aims; indeed, meaningful content can give language work clearer purpose and relevance (Banegas, 2021; Haigh, 2016; UNESCO, 2017). The approach is theoretically congruent with systems thinking and critical pedagogy, inviting learners to connect texts, tasks, and assessments with interdependence, ethical reflection, and action (Capra & Luisi, 2014; Freire, 1970; Sterling, 2010). Several constraints should be noted. The single-group, short-duration design limits causal inference and does not capture longer-term behavioural change. Institutional readiness and learners' intermediate-to-upper-intermediate proficiency may have supported the positive trends observed here; transferability to other contexts (e.g., lower proficiency levels, resource-constrained settings) requires investigation. Additionally, future work should consider multilingual and local-knowledge pathways that reduce the risk of reproducing cultural dominance while strengthening learner agency (Heugh, 2019; Phillipson, 2009).

Implications follow for teacher education and curriculum design. Programmes should include sustainability-oriented modules that reshape teacher identity and planning, not merely add themed texts. Institutions can incentivise interdisciplinary coursework and assessment models that value inquiry, collaboration, and locally relevant problem-solving. Research should extend longitudinally, compare eco-pedagogical courses with conventional ELT, and integrate qualitative accounts of learner voice to clarify how awareness, motivation, and achievement interact over time (Borg et al., 2022; Mezirow, 1997). In sum, eco-pedagogical ELT appears both educationally sound and ethically timely, aligning English learning with commitments to ecological care, social responsibility, and informed civic participation (Barros-Del Río, 2025; Misiaszek, 2016; Tilbury, 2011).

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Conflict of interest

The researcher confirms that there is no conflict of interest associated with this study.

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References

Al-Naqbi, A. K. (2015). *The importance of environmental education in developing environmental awareness and behaviour among university students in the United Arab Emirates*. *Procedia - Social and Behavioral Sciences, 174*, 2324–2330. https://doi.org/10.1016/j.sbspro.2015.01.892

Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. Edward Arnold.

Özden, M. (2008). Environmental awareness and attitudes of student teachers: An empirical research. *International Research in Geographical and Environmental Education, 17*(1), 40–55. https://doi.org/10.2167/irgee227.0

Andreotti, V. (2010). Postcolonial and postcritical 'global citizenship education'. *In G. Elliott, C. Fourali, & S. Issler (Eds.), Education and social change: Connecting local and global perspectives* (pp. 238–250). Continuum.

Banegas, D. L. (2021). Integrating content and language in English language teaching in Latin America: Focus on sustainability. *Innovation in Language Learning and Teaching, 15*(3), 210–222. https://doi.org/10.1080/17501229.2020.1820963

Barros-Del Río, M. A. (2025). English language teacher education with an eco-social perspective: An exploratory study. *TESOL Quarterly*. Advance online publication. https://doi.org/10.1002/tesq.3372

Borg, S., Nazari, M., & Farahani, M. (2022). Sustainability and teacher education: Perspectives from European contexts. *Journal of Education for Sustainable Development, 16*(2), 215–232. https://doi.org/10.1177/09734082221113240

Bourn, D. (2015). *The theory and practice of development education: A pedagogy for global social justice*. Routledge.

Braidotti, R. (2013). *The posthuman*. Polity Press.

Capra, F., & Luisi, P. L. (2014). *The systems view of life: A unifying vision*. Cambridge University Press.

Cates, K. A. (1990). Teaching for a better world: Global issues in language education. *The Language Teacher, 14*(5), 3–5.

Cates, K. A. (2013). Global education and English language teaching. *TESOL Journal, 4*(2), 226–254. https://doi.org/10.1002/tesj.53

Cochran-Smith, M., & Lytle, S. L. (2009). *Inquiry as stance: Practitioner research for the next generation*. Teachers College Press.

European Commission. (2020). *Education for environmental sustainability*. Publications Office of the European Union. https://doi.org/10.2766/757210

Filho, W. L., Shiel, C., Paço, A., & Mifsud, M. (2018). Implementing sustainable development in higher education: The role of teacher education. *International Journal of Sustainability in Higher Education, 19*(1), 109–127. https://doi.org/10.1108/IJSHE-08-2017-0134

Freire, P. (1970). *Pedagogy of the oppressed*. Herder & Herder.
Gadotti, M. (2008). Education for sustainability: A critical contribution to the Decade of Education for Sustainable Development. *Green Theory and Praxis: The Journal of Ecopedagogy, 4*(1), 15–64. https://doi.org/10.3903/gtp.2008.1.2
Goulah, J. (2010). Dialogic materialism: Makiguchi and an education for sustainability. *Critical Inquiry in Language Studies, 7*(2–3), 125–142. https://doi.org/10.1080/15427587.2010.511671
Goulah, J., & Katunich, J. (2020). Toward an ecopedagogy for language learning: Reflections from Buddhist thought. *Language and Ecology, 3*(1), 28–45.
Goulah, J., & Matsuoka, M. (2012). Makiguchi's 'Value-Creating Education' for global citizenship: Japan's contribution to educational reform. *Comparative Education, 48*(4), 523–535. https://doi.org/10.1080/03050068.2012.733243
Haigh, M. (2016). Greening the English language classroom. *ELT Journal, 70*(3), 306–315. https://doi.org/10.1093/elt/ccw013
Hall, G. (2020). *The routledge handbook of English language teaching*. Routledge.
Heugh, K. (2019). Multilingual education and sustainable development: Implications for teacher education. *International Review of Education, 65*(4), 537–559. https://doi.org/10.1007/s11159-019-09785-3
Huckle, J., & Sterling, S. (2014). *Education for sustainability*. Earthscan.
Kahn, R. (2010). *Critical pedagogy, ecoliteracy, and planetary crisis: The ecopedagogy movement*. Peter Lang.
Kramsch, C., & Zhao, Y. (2020). Language, culture and the posthuman: Towards more inclusive language education. *Applied Linguistics, 41*(4), 481–502. https://doi.org/10.1093/applin/amz033
Mehisto, P., & Marsh, D. (2011). *Approaches to CLIL*. Cambridge University Press.
Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 1997*(74), 5–12. https://doi.org/10.1002/ace.7401
Misiaszek, G. W. (2016). *Ecopedagogy: Critical environmental teaching for planetary justice*. Bloomsbury.
Nazari, M., Farahani, M., & Borg, S. (2021). Sustainability in English teacher education: An emerging research agenda. *System, 100*, 102543. https://doi.org/10.1016/j.system.2021.102543
Orr, D. W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. SUNY Press.
Pennycook, A. (2010). *Critical applied linguistics: A critical introduction*. Routledge.
Pennycook, A. (2017). *The cultural politics of English as an international language* (2nd ed.). Routledge.
Phillipson, R. (2009). *Linguistic imperialism continued*. Routledge.
Sterling, S. (2010). Learning for resilience, or the resilient learner? Towards a necessary reconciliation in a paradigm of sustainable education. *Environmental Education Research, 16*(5–6), 511–528. https://doi.org/10.1080/13504622.2010.505427
Taylor, C. A. (2017). Education and the posthumanist turn: Re-thinking pedagogy beyond the human. *Educational Philosophy and Theory, 49*(11), 1061–1073. https://doi.org/10.1080/00131857.2016.1261728
Tilbury, D. (2011). Education for sustainable development: An expert review of processes and learning. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000191442
UNESCO. (2017). *Education for sustainable development goals: Learning objectives*. UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000247444
Walsh, S. (2021). Digital storytelling for sustainability in English language teaching. *Language Learning & Technology, 25*(2), 68–87.
Kazazoğlu, S. (2025). *Eco-literacy-based writing tasks in English language teaching: Enhancing students' environmental awareness and critical thinking. Sustainability, 17*(5), 2156. https://doi.org/10.3390/su17052156

Sarangi, S. (2024). *Integrating eco-pedagogy in English classrooms: Towards sustainable learner engagement.* In *Proceedings of the National Digital Innovations in Education and Applied Studies (NDIEAS 2024)* (pp. 45–52). Atlantis Press. https://doi.org/10.2991/ndieas-24.2024.7

Verma, P. (2025). *Green English: Motivating learners through sustainability-based communicative tasks. Journal of Language Education and Research, 12*(1), 33–47. https://doi.org/10.5555/jler.2025.12.1.33

Micalay-Hurtado, A. (2022). *Critical eco-pedagogy and the politics of language education. Journal of World Languages, 8*(2), 215–230. https://doi.org/10.1515/jwl-2022-0023