

“Climate Change Is Destructive; I will Address It in My Class”: Pre-service English Teachers’ Perspectives on Climate Change and Its Integration into ELT

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Article information	
Abstract	English language teaching (ELT) shares responsibility with other fields to address environmental issues, including climate change. However, research on English students’ perspectives on climate change in teacher education is scarce, leading to a lack of understanding of future English teachers’ current knowledge and willingness to address the issue. This qualitative case study aimed to explore pre-service English teachers’ perspectives on climate change and its integration into ELT. Fifteen participants from an English education department at a private university in Surabaya, Indonesia, were involved. Data were collected through opinion paragraph writing and an open-ended questionnaire, which were analyzed using content analysis. Results of the participants’ perspectives suggested that pre-service English teachers had sufficient understanding of climate change. They also demonstrated willingness to address the issue in their respective field of ELT as they proposed ideas on English instructional strategies about climate change, both in the classroom and outdoors. These findings offer critical

	implications for both policy and practice regarding the integration of the topic of climate change into ELT.
Keywords	climate change, language teacher education, environmental sustainability, Eco-ELT, teacher cognition
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1. Introduction

Human encroachments on nature have led to planetary quagmires, such as climate change and biodiversity loss, necessitating immediate and coordinated efforts across sectors and disciplines. As one of the disciplines in education, English language teaching (ELT) carries a social responsibility that extends beyond merely enhancing English proficiency of students to shaping their critical and ecological thinking (Xiong, 2014). In this context, ELT's present duty is to transform the role of English education as a pathway for environmental advocacy, cultivating both language learners' English proficiency, and their critical and ecological responses toward environmental violence. Katunich and Goulah (2020) underscore ELT's vital role in addressing sustainability crises and hence further advocate a new ethic of language teaching in the Anthropocene era. This involves altering the current model of ELT practices to focus more on empowering students as future leaders to achieve sustainable development goals (SDGs) (Jodoin, 2022).

Fulfilling the responsibility of ELT in promoting environmental sustainability is feasible. The nature of English lessons provides an apt platform for more comprehensive intellectual and philosophical discussions among students, allowing them to delve into topics related to the natural environment and the ethical treatment thereof, often explored through literary texts (Beigel, 1996). Through these lessons, students can engage in discussions and projects focusing on nature, thereby enhancing their knowledge, fostering positive attitudes, and

encouraging favorable behaviors toward nature, all while improving their English proficiency. For that reason, Bowden (2010) has advocated for incorporating sustainability and environmental issues into ELT (Mercer et al., 2022) at all levels of English education, including in teacher education. Yu et al. (2024) further highlight that integrating sustainability into ELT through innovative approaches—such as interdisciplinary curricula, interactive activities, teacher training, and new assessment methods—not only enhances language skills but also raises students' environmental awareness and motivates them toward sustainable actions.

In the realm of English teacher education, there have been concerted endeavors to integrate environmental sustainability issues. Various approaches have emerged, including specific courses on sustainable development (SD) (Findik et al., 2021), critical environmental courses focusing on ecocriticism (Saiful & Setyorini, 2022), and ecofeminism (Echegoyen-Sanz & Martin-Ezpeleta, 2021). Moreover, English instructional materials—including chapters, units, lessons, and passages—also serve as potential avenues for teaching environmental sustainability (Ganji et al., 2020). This initiative is rooted in two key goals of sustainability integration into English teacher education. First, it aims to foster English teachers' sustainable professional growth and development (Saiful & Setyorini, 2022) and sustainability attitudes (Echegoyen-Sanz & Martin-Ezpeleta, 2021). Second, it seeks to promote communicative language teaching (CLT) and translate the concept of global citizenship into practical applications (Tavakkoli & Rashidi, 2020).

Empirical evidence has demonstrated the positive impact of integrating environmental sustainability into the training of future English as a foreign language (EFL) teachers. This integration has been shown to enhance teachers' sense of connection to and interest in nature (Saiful, 2024a); improve English reading skills, ecoliteracy, and vocabulary learning (Haggag, 2023); raise climate change awareness (Silvhiany et al., 2023); and develop pedagogical content knowledge of sustainability (PCKS), which is the understanding of how to teach

sustainability issues in English lessons (Saiful & Setyorini, 2022). While these benefits highlight the value of incorporating sustainability into EFL teacher education, the process is not without its challenges.

To illustrate, Mercer et al.'s (2022) study on English teachers' attitudes and experiences regarding teaching environmental issues found that many considered integrating sustainability into ELT as optional, rather than a moral or ethical duty. Data were gathered using an international online survey of over 90 English teachers and in-depth interviews with five. Moreover, the study revealed systemic challenges, including a lack of formal training on teaching environmental issues and limited resources for sustainability education. To overcome these obstacles, Mercer et al. (2022) advocate for further research and practice in environmental education within ELT, emphasizing that language teaching, like all education, has a responsibility to address sustainability and contribute to a more sustainable society (UNESCO, 2005).

However, research in this area remains limited. The aforementioned studies primarily focused on methods for incorporating sustainability concepts into ELT teacher education. While a more recent study by Silvhiany et al. (2023) successfully revealed ways to improve future English teachers' awareness of climate change, it failed to provide crucial insights into their current perspectives on climate change and their ideas for ELT instructional strategies related to the topic. Consequently, there remains a gap in understanding future English teachers' knowledge of climate change and its integration into their teaching practices. Hence, the current study aimed to further explore the practices of environmental sustainability integration into English language teacher education, recognizing its potential and importance. The study built on empirical evidence demonstrating the flexibility of ELT teacher education in integrating climate change education (Silvhiany et al., 2023).

Addressing this knowledge gap is essential in understanding the current level of comprehension among future English teachers regarding climate change crises. It also provides a pathway for anticipating their willingness to address climate change challenges in their future ELT classrooms. This information on understanding and willingness can help policymakers in English teacher education institutions evaluate and reflect on their commitments and efforts to create future educators who are equipped to promote sustainability. Therefore, this study aimed to explore pre-service English teachers' perspectives on climate change and its integration into ELT, thereby addressing the existing gap in the research. The research questions of the current study are as follows:

1. What are the perspectives of pre-service English teachers on climate change?
2. What are pre-service English teachers' perspectives on integration of climate change into ELT?

2. Literature Review

2.1 Eco-ELT

Eco-ELT was first introduced by Saiful in 2014, refined in 2020, and further developed in 2023. It is defined as the study and practice of environmental education within ELT (Saiful, 2023; 2024b). Therefore, any study or practice of environmental education using any approach falls under Eco-ELT. The foundation of Eco-ELT is rooted in social constructivism, particularly in second language learning and acquisition. Eco-ELT posits that students gain environmental knowledge and acquire language skills through interactions with their natural surroundings, eco-learning materials, and ecocritical discussion and writing (Saiful, 2023). Thus, Saiful (2024) contends that Eco-ELT establishes a learning environment where students actively engage with environmental topics through language. It emphasizes collaborative learning, enabling students to deepen their understanding of environmental issues while using English as a tool for exploring and discussing ecological concepts. This approach not only enhances their language skills but also strengthens their comprehension of environmental issues

by integrating language practice with meaningful content. Ultimately, Eco-ELT practices can cultivate students' pro-environmental behaviors, benefiting the well-being of nature (Saiful, 2024).

In Eco-ELT practice, various approaches and instructional methods have been utilized. These include not only environmental literary works but also methods such as content- and task-based language learning (Hauschild et al., 2012; Nkwetisama, 2011), ecocomposition (Elsherif, 2013), and environmental essay writing (Setyowati et al., 2022). These methods have been empirically shown to enhance students' environmental awareness (Elsherif, 2013) and language skills, particularly in writing (Setyowati et al., 2022). Moreover, empirical evidence shows that Eco-ELT practices develop students' vocabulary learning (Chai & Bin Swanto, 2020), reading skills (Thanya & Suganthan, 2023), environmental knowledge such as climate science (Goulah, 2015), positive attitudes toward the environment (Fauzan, 2013), ecological identities (Matthewman, 2017), and social and collaboration skills (Brown et al., 2017). For English teachers, Eco-ELT fosters awareness of the relationship between humans and nature. Based on these studies, Saiful (2023) concludes that Eco-ELT aims to develop English learners linguistically, intellectually, emotionally, and socially, while also shaping English teachers into morally ecological educators who support environmental protection.

Given the goals of Eco-ELT, its practice aligns closely with the mission of environmental sustainability. Implementing Eco-ELT can act as a catalyst for achieving sustainable development goals (SDGs) such as climate action, life below water, life on land, and quality education. Therefore, it is crucial to consistently support efforts to advance the Eco-ELT movement. In addition, it is also important to acknowledge that the practice of Eco-ELT faces challenges, such as limited formal training for teachers and a lack of teaching materials (Mercer et al., 2022). Teachers must consider their specific teaching contexts, including the school environment, curriculum, students' interests, and relevant social and environmental issues when implementing Eco-ELT. While Eco-ELT supports the

principles of post-method pedagogy, giving teachers full autonomy in their approach, these contextual factors remain crucial (Saiful, 2023).

Empirical studies on Eco-ELT have demonstrated its successful implementation and its positive impact on enhancing English learners' environmental awareness and identity. Setyowati et al. (2022) explored mental models in teacher education, investigating pre-service English teachers' opinions on using environmental topics in an essay writing course. Their findings revealed that students held positive views on integrating these topics, which broadened their understanding of current environmental situations. Additional studies on mental models focused on in-service teachers. Mercer et al. (2022) examined English teachers' attitudes and experiences with teaching environmental issues in ELT, while Hameed (2023) studied English teachers' knowledge and perceptions in Saudi Arabia regarding the implementation of environmental education in ELT.

The relevant studies mentioned fall short in providing specific information on the current state of pre-service English teachers' mental models of climate change and its integration into ELT. Previous efforts have primarily delved into perspectives and acceptance of sustainability integration into ELT, encompassing few pre-service and most in-service English teacher contexts. Thus, more attempts to examine sustainability within teacher education are warranted (Mercer et al. 2022), especially concerning the issue of climate change and its practices in ELT. These efforts have yielded important insights into the comprehension and willingness of pre-service English teachers to address climate change.

2.2 Teacher Perspective

This study defines pre-service English teachers' perspectives on climate change as viewpoints or perceptions of climate change and its integration into ELT. This conceptualization is grounded in the delimitation of teachers' perspectives in teaching, as outlined by Zaiturrahmi et al. (2021), which refers to the teachers' views on the methods of teaching. In the context of ELT, teachers' perspectives

also encompass their views or perceptions on specific aspects or issues related to teaching, as exemplified by studies such as Kong (2020), which explored ELT teachers' perspectives on the role of teacher autonomy in teaching English as a foreign language (TEFL).

Teacher perspectives are fundamental elements of cognitive constructs, operating within the framework of language teacher cognition theory. According to this theory, what language teachers know, believe, and think directly influences their classroom practices (Borg, 2003). Therefore, language teachers' perspectives are critical in shaping their actions and decision making in educational contexts (Saiful, 2019). For instance, Saiful (2019) found that English teachers chose to teach vocabulary and genre-based texts using YouTube vlogs because they believed in the educational value of vlogs, understood how to effectively integrate them into their lessons, and considered their students' characteristics and learning styles. This decision to use YouTube vlogs in ELT was driven by the teachers' beliefs, knowledge, and thinking.

In the context of teaching environmental issues, if English teachers view teaching climate change topics as essential for developing students' environmental literacy and language skills, they are more likely to incorporate these topics into their English lessons. They will select appropriate and well-informed materials on climate change and implement project-based learning and discussions in the classroom. Additionally, teachers' perspectives significantly impact their work ethic. Research shows that a teacher's perspective influences their sense of responsibility, motivation, and actions in the classroom. When teachers hold positive perspectives, they demonstrate greater persistence and commitment to their students (Lauermann, 2014).

Furthermore, teacher perspectives play a significant role in shaping students' attitudes, particularly in environmental teaching contexts. Recent research has indicated that, concerning the rhetorical, metacognitive, and

cognitive skills required in writing, teachers' perspectives can impact students' attitudes toward the students' compositions in environmental writing (Yasukawa, 2023). Similarly, in the context of language skills development, teachers' perspectives are crucial. For example, recent scholarship has demonstrated that teachers' perspectives contribute to the quality of academic writing, given that students' writing skills depend upon their teachers' views on their rhetorical, metacognitive, and cognitive skills in writing (Bui et al., 2023).

Existing scholarship has highlighted the crucial and diverse roles that teachers' perspectives play in shaping their classroom practices and work ethic, as well as their students' learning attitudes and language development. However, it is also important to recognize that teachers' perspectives on issues related to language learning and teaching are influenced by their personal and professional experiences. Thus, language cognition and professional development are interconnected (Borg, 2019). To illustrate, in the context of teaching environmental crises, Mercer et al. (2022) found that English teachers received minimal formal training in environmental education within ELT. This lack of training may have affected the formation of teachers' perspectives on integrating environmental education into ELT, which, in turn, influenced their actual classroom practices. The study by Mercer et al. (2022) further revealed that English teachers often viewed the integration of sustainability as an optional topic, rather than as a moral and ethical duty or a human responsibility to protect the environment.

2.3 Climate Change

Climate change has become a widespread issue impacting economic, social, and political spheres (De Meyer et al., 2021; Petrescu-Mag et al., 2022). It is inherently ideological, with disagreements stemming from differing values, identities, and purposes (Hulme, 2009). Addressing climate change requires engaging with various ideologies and implementing solutions across multiple sectors. Abbas et al. (2022) stress the need for government involvement and global commitments to effectively address climate change impacts and develop long-

term solutions. In response, UNESCO, through the United Nations Conference on Climate Change (COP28) in 2023, launched the Declaration on Climate Change and Education. This declaration, signed by 39 countries, focuses on adaptation, mitigation, and investment (UNESCO, 2024). UNESCO (2024) emphasizes that effective climate change communication and education are crucial for helping citizens understand and act on climate issues, aiming to foster understanding, values, and behaviors that support collective climate action.

Considering that climate change is a major global societal concern currently under widespread discussion (Gago & Sá, 2021) and its potential for ecojustice education (Dentith & Thompson, 2017), some countries have already incorporated climate change into their curricula, often integrating it into science teaching through creative methods (Diquito, 2021). It is also integrated with literacy education, particularly in adult literacy programs crucial for conveying environmental awareness, including the imminent climate change catastrophe (Damico et al., 2020). Australia, for instance, has offered literature in adult basic education (ABE) for over 40 years, with research suggesting that teachers not only play a significant role in imparting knowledge about climate change but also influence students to actively engage in environmental issues (Bleazby et al., 2023; Yasukawa, 2023).

Given that climate change is a central topic in schools, teachers are prompted to shift from maintaining the conventional view of science as mere content knowledge to embracing new attitudes toward the role of government and a commitment to action (Oversby, 2015). Consequently, climate change transcends the boundaries of science and becomes a cross-disciplinary subject. Research indicates that in cross-disciplinary classes focusing on climate change, students not only gain scientific knowledge but also broaden their worldview and increase their willingness to take mitigative actions (Tolppanen et al., 2022).

In ELT, climate change education has been introduced, but its presence is still limited. According to Saiful's (2024b) systematic literature review of Eco-ELT efforts from 1980 to 2024, only 3% of the 116 articles addressed climate change, with just four papers covering the topic (Goulah, 2015; 2020; Noto et al., 2022; Silvhiany et al., 2023). This finding highlighted the need for more research on climate change education in second and foreign language programs (Silvhiany et al., 2023). One existing effort used instructional approaches like connected learning and ecojustice pedagogy in a creative writing course, which successfully increased future English teachers' awareness of climate change (Silvhiany et al., 2023). Another initiative developed climate change reading materials for high school students to meet the growing demand for resources on the topic (Noto et al., 2022). Other programs created curricula specifically for English language learners (ELLs) focused on climate change (Goulah, 2015; 2020). These programs suggest that even small curricular changes can effectively expose English learners to the realities of climate science and climate change (Goulah, 2020).

3. Methodology

3.1 Research Design

This study employed a qualitative case study design, chosen for its capacity to facilitate an in-depth exploration of intricate phenomena within a specific context (Rashid et al., 2019). By employing this design, this study could explore deeply the pre-service English teachers' perspectives regarding the specific context of environmental issues and climate change, and its integration into ELT.

Merriam (1998) defines the characteristics of case study research as being centered on the clear boundaries of the case itself, which can be an object, a single entity, or a unit defined by its context. This study specifically focused on Merriam's (1998) concept of a qualitative single case study, which involves a holistic description and analysis of a bounded phenomenon, such as a program, institution, person, process, or social unit. This study found a unique and intricate

phenomenon of an environmental sustainability program within EFL teacher education: teaching English academic writing on climate change issues.

The program was implemented by the Department of English Education at the College of Education in a university in Surabaya, Indonesia as part of a broader effort to align teacher education with global educational goals for sustainability, as emphasized by UNESCO (2005). The program aimed to shape the cognition of future English teachers to promote sustainable pedagogical practices in English classrooms (Saiful & Setyorini, 2022). Conducted over three weeks and involving 15 students, this study provides valuable insights into how such a program can influence future English teachers' perspectives on climate change and its integration into English lessons. Given the rarity of sustainability-focused initiatives in English teacher education (Saiful & Setyorini, 2022), this single case study is crucial for understanding the readiness of future English teachers in addressing climate change and protecting our planetary ecosystem from ecological crises.

This single case study was limited to the perspectives of EFL pre-service teachers on climate change and its integration into EFL teacher education in Indonesia. Therefore, the results primarily reflect this specific context. However, it is possible that the findings may be transferred to similar contexts in other ELT teacher education institutions in EFL countries, particularly those focused on climate change education practices.

3.2 Participants

This study involved 15 EFL pre-service teachers, consisting of 11 females and four males. All participants were students in the English education department within the faculty of teacher training and education at a private university in Surabaya, Indonesia. Importantly, they had completed an environmental sustainability program designed for future English teachers, which included an academic English writing course focused on climate change. Therefore, their

participation in this study was valuable as it provided essential insights into the perspectives and approaches of future English teachers regarding climate change issues and their integration into ELT.

The participants were selected purposively (Merriam, 1998) based on specific criteria. Firstly, participants had to have sufficient knowledge of ELT. The participants of this study were in the third semester of their studies, having successfully completed required courses on Teaching English as a Foreign Language (TEFL) and language learning and acquisition. This ensured they possessed a fundamental understanding of ELT, making their perspectives on ELT practices credible. Secondly, participants had to be ethically appropriate. In this study, all participants were above 18 years old and willing to participate voluntarily in the research, expressing their consent through the signing of an ethical research form.

3.3 Data Collection Instruments and Procedures

The study employed environmental opinion writing and an open-ended questionnaire to obtain data on the perspectives of pre-service English teachers regarding climate change and its integration in ELT. The participants of this study were instructed to express their opinion on climate change in an English paragraph within a 30-minute time limit. The completed writing was directly submitted to the researchers, who later scanned and analyzed the submissions. The writing instruction itself was: *please make an opinion paragraph about climate change.*

The open-ended questionnaire was administered after the writing task and comprised of two sections. The first section gathered personal information, including gender and age. The second section focused on eliciting the participants' perspectives on climate change and its incorporation into ELT. The questionnaire was administered online via Google Forms, with participants utilizing their smartphones to respond. The questions posed in the questionnaire were as follows:

1. *Please share your views on climate change.*

2. *As future English teachers, how do you tackle climate change in your English classes? Please elaborate your responses.*

3.4 Data Analysis

Inductive content analysis (ICA) was employed for this study. This method is designed for analyzing text-based data, involving a thorough reading of the texts rather than searching for a predetermined list of content items, and for generating content categories (broad ideas or concepts from the data) (Vears & Gillam, 2022). Using the ICA approach, we thoroughly analyzed text-based data from environmental opinion writing and an open-ended questionnaire, leading to the identification of content categories related to perspectives on climate change and its integration in ELT. Regarding perspectives on climate change, the study identified three types: effects, origins, and solutions to climate change. In terms of climate change integration, two categories of indoor and outdoor ELT practices were found.

The study used the following coding system, “SS” denoted students, and numerical representations (e.g., SS1) referred to specific student identifiers. Other codes pertained to the data sources and their corresponding emerging content category. For instance, the code *“SS1, open-ended questionnaire, climate change effect”* indicated that the data originated from student number 1, were obtained from the open-ended questionnaire, and were about students’ views on the effects of climate change. These detailed codes were designed to facilitate readers in tracing the data and validating the study’s results.

3.5 Trustworthiness and Research Ethics

To ensure the trustworthiness of this qualitative study, particularly in terms of credibility, the researchers employed methodological triangulation, using two data collection methods—environmental opinion writing and an open-ended questionnaire—to address the research questions. Additionally, investigator

triangulation was utilized, with two researchers collaborating to collect and analyze the data. To enhance transferability, the study provided detailed procedures for data collection and analysis. For dependability, clear and thorough coding of data sources was conducted to maintain transparency. Finally, to ensure confirmability, the outcomes of the data analysis and interpretations were shared with and validated by the participants.

Ethical considerations were prioritized, involving the use of a consent form to communicate risks, benefits, and the research agenda. Confidentiality of participant information was strictly maintained, employing codes such as SS1, SS2, and so forth. The study refrained from disclosing the institution's name for added confidentiality. In summary, this study adhered to high ethical research standards.

4. Results

This study identified two categories of views held by the EFL pre-service English teachers. The first category pertains to their perspective on climate change issues, which reflects their current comprehension or awareness on the topic from the effects to solutions. The second category involves their ideas for integrating climate change into ELT. This study found two instructional strategies: indoor classroom activities and outdoor learning experiences.

4.1 What are the perspectives of pre-service English teachers on climate change?

The data analysis of environmental opinion writing and open-ended questionnaires revealed three key findings, presented in Figure 1.

Figure 1*Pre-service English Teachers' Perspectives on Climate Change*

Figure 1 shows three types of perspectives on climate change held by the pre-service English teachers. Firstly, they predominantly viewed climate change as a substantial global environmental challenge affecting both the Earth and humanity. For instance, SS2 stated that climate change had significant adverse impacts on both the Earth and humans, and hence, attempts to address climate change were necessary. SS6 opined that climate change was a global environmental issue primarily caused by human activities, leading to natural disasters.

Climate change has a huge bad impact for the Earth and humans, and we must take any actions to tackle climate change... (SS2, *environmental opinion writing, climate change effect*)

Climate change is the problem of all countries. The cause of climate change is from human activity. One of the impacts is flooding. (SS6, *open-ended questionnaire, climate change effect*)

The second result pertains to the pre-service English teachers' perspectives on the origins of climate change. They acknowledged that climate change could stem from diverse factors including natural processes, industrial activities, and human actions. SS3, for instance, highlighted that human activities like pollution and deforestation contributed to climate change, resulting in natural disasters. Similarly, SS14 expressed that climate change was induced by human activities generating toxic compounds, impacting both the environment and human health.

In my perspective, climate change can be caused by many things, for example pollution from industry, logging, and burning of forests (deforestation) to build industrial land, and so on. In addition to that, climate change is also the cause of many natural disasters these days. *(SS3, environmental opinion writing, origins of climate change)*

Climate change is generally caused by pollution due to human activities which can produce several toxic compounds that can interfere with human activities and health. Moreover, climate change can also be due to lack of green areas. *(SS14, open-ended questionnaire, origins of climate change)*

The third finding relates to the pre-service English teachers' perspectives on solutions for climate change. They acknowledged the need for diverse actions across sectors and disciplines to address this issue, including developing human awareness of climate change, planting more trees, and keeping the environment clean. SS14, for example, asserted that the causes of climate change were rooted in human activities, and the solution lied in human awareness.

The causes are human activity itself, for example cutting down trees without replanting, the use of plastics, and motorized vehicles

are not environmentally friendly. The solution should start from humans themselves, who must be aware of climate change. Other forms of solution are loving the environment such as planting trees and keeping the environment clean. *(SS14, open-ended questionnaire, solutions to climate change)*

The key findings presented in section 4.1 reveal that pre-service English teachers primarily viewed climate change as a major global environmental issue caused by diverse factors, with serious adverse effects on both the Earth and humanity, necessitating urgent actions across sectors and disciplines. They also recognized that activities such as pollution and deforestation were significant contributors to climate change, leading to natural disasters and harming both the environment and human health. Furthermore, they emphasized that raising human awareness was essential to addressing climate change and advocated for actions like planting trees and maintaining a clean environment to mitigate the effects of human-induced environmental damage.

4.2 What are pre-service English teachers' perspectives on integration of climate change into ELT?

The pre-service English teachers put forth several proposals for integrating climate change into ELT, as shown in Figure 2.

Figure 2

Pre-service English Teachers' Perspectives on Integration of Climate Change into ELT

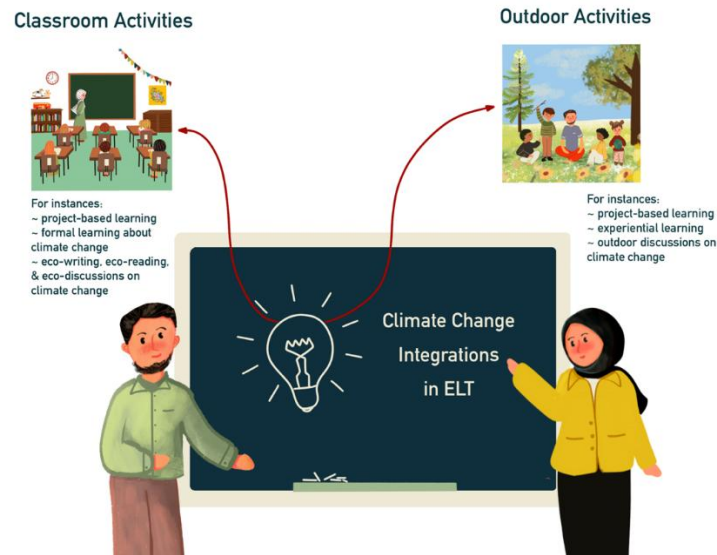


Figure 2 illustrates the perspectives of pre-service English teachers on integrating climate change into ELT. They believed that climate change issues could be incorporated into English lessons and proposed various instructional approaches for this integration, including both in-class and out-of-class activities. For in-class activities, they suggested methods such as project-based learning, formal instruction on climate change, eco-writing, eco-reading, and eco-discussions. For example, SS3 highlighted the idea of conducting indoor activities like discussions. SS11 elaborated on raising student awareness by having them write an article and share it on social media. SS13, in agreement, suggested reading an article about climate change as an effective activity.

If I were an English teacher and want to talk about the solution for climate change, I think I would show my students a short video about climate change and ask for their opinion about the video. Afterwards, I will ask my students about what they can do to prevent climate change. *(SS3, open-ended questionnaire, indoor ELT integration)*

In my opinion, we can do writing activities such as writing articles in English regarding how to deal with climate change and sharing it in blogs or social media. *(SS11, open-ended questionnaire, indoor ELT integration)*

I will invite students to read the climate change texts in English that I have provided and then I will ask them to write English paragraphs about the solutions to climate change. *(SS13, open-ended questionnaire, indoor ELT integration)*

For outdoor classrooms, they proposed strategies such as project-based learning, experiential learning, and outdoor discussions on climate change. For instance, SS1 expressed a preference for project-based learning as an effective activity for teaching vocabulary. SS3 provided further clarification, suggesting that a suitable outdoor learning process would involve experiential learning, which would be instrumental in finding solutions to climate change. SS1 echoed this sentiment, proposing outdoor activities in the form of speaking/discussion activities centered around climate change. SS2 concurred, emphasizing that discussions were essential for raising students' awareness of climate change.

I will make a farming project with students to address climate change along with learning English vocabulary about plants. *(SS1, open-ended questionnaire, outdoor ELT integration)*

If I were an English teacher and wanted to teach the solutions to climate change, I think I would ask my students to go to some parts of the school, such as the canteen, garden, yard, or library. Then they would be given a task to examine the situation there, after that they were asked to present their results of observation and share it with the others in the next meeting. The observation would be about the conditions of the

place, such as is it hot, cold, or so on, and the causes of the conditions. They must take notes on anything they find during observation and find a solution to it. *(SS3, open-ended questionnaire, outdoor ELT integration)*

I think speaking learning process is appropriate in outdoor learning activity which is student can discuss climate change. *(SS11, open-ended questionnaire, outdoor ELT integration)*

It can be in the form of environmental discussions outside the classroom... and do environmental writing activities. *(SS2, open-ended questionnaire, outdoor ELT integration)*

The key findings shown above reveal that pre-service English teachers recognized and understood the potential for integrating climate change into ELT. They recommended incorporating a variety of interactive methods, both in-class and outdoors, including the use of videos, discussions, eco-writing, eco-reading, project-based learning, and experiential learning.

5. Discussion

This study unveiled two important findings. The results pertaining to the first research question about pre-service English teachers' perceptions on climate change showed that participants viewed climate change as a global environmental problem affecting the Earth and humanity. They acknowledged its complexity, recognizing it as a multifaceted problem caused by various factors, thereby necessitating diverse solutions across sectors and disciplines. Their perspectives aligned with the current characterization of climate change as a pervasive, everyday phenomenon (De Meyer et al., 2021) impacting various sectors of life, including economic, social, and political dimensions (Petrescu-Mag et al., 2022). Their perceptions, which demonstrated a strong understanding of climate change, are essential for effectively integrating this issue into ELT.

As Borg (2003) suggests, teachers' cognition—encompassing their thinking, knowledge, and beliefs—directly influences their classroom practices. A comprehensive perspective on climate change will enable teachers to design detailed content for their lessons and confidently address questions from students related to the topic. Additionally, these holistic perspectives could foster a positive worldview among future English teachers regarding the importance of integrating climate change education into ELT. They may also instill a sense of moral and ethical responsibility, encouraging educators to actively participate in addressing climate crises and protecting planetary ecosystems from ecological catastrophes.

The first results also complement the existing finding by Setyowati et al. (2022), which indicate pre-service English teachers' positive views on sustainability integration in English writing classes. The positive views can be reinforced by incorporating diverse sustainability topics, with a particular emphasis on climate change. This suggestion is based on our study's finding that pre-service English teachers exhibited a sufficient understanding or awareness of climate change issues. Thus, pre-service English teachers could engage in English argumentative essay writing on climate change.

Acknowledging that climate change is deeply intertwined with ideological frameworks (Hulme, 2009), addressing it requires critically engaging with the underlying ideologies, worldviews, and perspectives that shape our understanding of the issue. This study contributes to this effort by highlighting the comprehensive perspectives of future English teachers on climate change, which are crucial for fostering climate action (Zawadzki et al., 2020). Unlike those who may view climate change as a minor or unreal issue, these pre-service teachers have recognized it as a complex and multifaceted problem, driven by various factors and demanding diverse solutions across sectors and disciplines.

This well-rounded understanding of climate change could inspire future English teachers to take meaningful climate actions in both their personal and professional lives. For instance, personally, they might practice recycling at home, conserve energy by turning off lights and air conditioning when they are not needed, reduce unnecessary online streaming, and use water responsibly. Professionally, they could incorporate climate change topics into English lessons through activities such as drama, ecocritical discussions, or project-based learning, thereby integrating environmental consciousness into their teaching practices.

The results of the second research question examining pre-service English teachers' perspectives on integration of climate change into ELT demonstrated that they could propose ELT instructional strategies for addressing climate change, incorporating both classroom and outdoor activities. In the classroom, they suggested approaches such as project-based learning, formal lessons on climate change, eco-writing, eco-reading, and eco-discussions. For outdoor activities, they recommended project-based learning, experiential learning, and outdoor discussions on climate change. Project-based learning was highlighted for both in-class and out-of-class activities because it promoted active learning and the real-world application of environmental concepts (Saiful, 2024b), which can develop students' environmental awareness (Nugraha & Ridwan, 2019). Similarly, ecocritical discussions on climate change were emphasized, as this approach enables students to identify, challenge, and evolve their views on nature and contemporary environmental issues within their own societies, both locally and globally (Goga et al., 2023).

The second results further indicate that pre-service English teachers possessed a high capacity for ecological thinking as they devised solutions to address climate change within their respective field of ELT. These findings imply the social responsibility of the ELT field to cultivate students' critical and ecological thinking beyond English proficiency (Xiong, 2014). These results linking

ELT strategies and climate change also built upon the findings of Setyowati, et al. (2020), who observed that pre-service English teachers could generate ideas for protecting and caring for the environment. However, in their study, these ideas centered around general environmental protection actions like planting trees, maintaining cleanliness, using public transportation, and recycling. In our study, pre-service English teachers demonstrated solutions that were relevant to their field of ELT, including strategies for teaching climate change issues in English lessons.

Moreover, the second results indicate that pre-service English teachers were willing to shift the current model of ELT practices to focus on sustainability, empowering students as future leaders to achieve sustainable development goals (SDGs) (Jodoin, 2022), as they proposed indoor and outdoor ELT instructional strategies addressing climate change. Besides, these results also contributed novel ELT instructional strategies for teaching on sustainability issues, especially climate change topics. Past studies have proposed some strategies such as content and task-based language learning instruction (Hauschild et al., 2012; Nkwetisama, 2011), ecocomposition (Elsherif, 2013), and environmental essay writing (Setyowati et al., 2022). Pre-service English teachers in this study added new strategies encompassing both indoor and outdoor activities, such as project-based learning, eco-reading, eco-discussion, and experiential learning.

All results from this study have extended our understanding of future English teachers' current perspectives on climate change, revealing that they possessed sufficient understanding of climate change and a willingness to address it in their respective ELT field. This study contributes to expanding the scope of sustainability research in the English teacher and teacher education fields, which have predominantly focused on in-service teachers' perspectives, as seen in works such as those by Mercer et al. (2022) and Hameed (2023). Additionally, this study responds to the need for more sustainability initiatives within English teacher education, as emphasized by Mercer et al. (2022). This study also validates

Bowden's (2010) assertion regarding the potential of incorporating sustainability issues into ELT.

6. Limitations and Future Research

The study has successfully elicited important information regarding the current perspectives of pre-service English teachers on climate change and its integration into ELT. However, in many respects, this study still has limitations. Firstly, the study did not delve into the determinants influencing pre-service teachers' perspectives on climate change and its integration in ELT. Further investigations could explore the factors that affect these perspectives. Secondly, this study did not perform interventions aimed at shaping the mental models of pre-service English teachers on climate change. Subsequently experimental studies could be conducted to examine the impact of sustainability programs in English teacher education on the pre-service teachers' perspectives on climate change. Thirdly, this study relied heavily on self-reported data, which may not have fully captured the real-life applications of pre-service English teachers' perspectives on climate change. Future research should incorporate observations of classroom behavior and activities to better understand how these perspectives are implemented in practice.

7. Conclusion

The present study explored the perspectives of pre-service English teachers regarding climate change and its integration into ELT. The findings reveal that these teachers had a comprehensive understanding of nature and sources of, and solutions related to, climate change. Additionally, they expressed diverse views on instructional strategies within ELT, advocating for both indoor and outdoor activities to address climate change.

Based on these results, the study suggests four important implications for policy and practice. Firstly, in terms of curriculum development, educational policymakers should consider integrating climate change content into the ELT

curriculum. Embedding climate change issues within language lessons would enable students to develop both language skills and climate change literacy simultaneously. This integration could include the creation of specific modules on climate change or the incorporation of eco-literature and eco-writing exercises into standard ELT curricula.

Secondly, regarding teacher training and professional development, the study highlights the readiness of pre-service teachers to engage with climate change topics. Therefore, teacher training programs should include modules on effectively teaching climate change within ELT. These modules would equip future educators with the knowledge and skills needed to implement both indoor and outdoor instructional strategies, such as project-based learning, experiential learning, and eco-discussions, in their teaching practices.

Thirdly, in terms of policy support for innovative teaching methods, the study indicates a need for policies that support diverse instructional strategies. Educational authorities should encourage and fund the implementation of approaches like project-based learning, experiential learning, and task-based language teaching, particularly in relation to climate change. Such policies could also provide incentives for schools to create outdoor learning spaces and resources that facilitate environmental education.

Lastly, regarding glocal (global and local) environmental education initiatives, the study underscores the importance of recognizing the global nature of climate change. Educational policies should promote both global and local environmental education initiatives within ELT. This could involve partnerships with international environmental organizations and community-based projects that allow students to apply their learning to real-world environmental issues in their local contexts.

8. About the Authors

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