The Role of Environmental Narratives in English Language: The Impact of Using Environmental Stories on Students' Consciousness

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Abstract
The study examines the effect of environmental stories on enhancing students' English proficiency and ecological awareness within their school setting (Sterling, 2001; Orr, 2004). Specifically, the research examines the role of environmental stories in teaching, focusing on their impact on students' reading and writing abilities, as well as their understanding of ecological themes. Grounded in ecocriticism, sociocultural theory, constructivist learning, and transactional reading theory, the research employed a pre-test/post-test experimental design involving 50 students divided into control and experimental groups. Over six weeks, the experimental group engaged with environmental narratives addressing climate change, deforestation, and pollution, while the control group followed a standard curriculum. Data were gathered using reading comprehension tasks and vocabulary quizzes and analyzed with paired sample t-tests using SPSS. Results from SPSS analysis revealed a statistically significant improvement in the experimental group's reading comprehension, vocabulary, and environmental understanding ($p = 0.000$). These findings suggest that integrating environmental narratives into English Language Teaching not only strengthens linguistic skills but also deepens students' ecological consciousness, contributing to broader educational goals aligned with sustainable development. The findings of this study align with previous research that recognizes the dual value of incorporating environmental topics into ELT. As Stibbe (2015) and Frawley (2014) note, this research demonstrates that ecological narratives can enhance both language skills and environmental awareness. This research aligns with the findings of Stibbe (2015) demonstrating that ecological narratives benefit children in both language learning and understanding of nature. The significant improvement in the experimental group's ecological knowledge and language proficiency further supports the claim that the inclusion of environmental content can deepen students' understanding of ecological issues while enhancing their language competencies, as Ghosn (2013) found in his study.

Keywords: Story-Based Learning, Ecological Consciousness, Language Skills, Environmental Education, Climate Change, Environmental Awareness, Vocabulary Development, Sustainable Development Goals (SDGs), Critical Thinking, Environmental Stewardship, Reading Comprehension, Writing skills

Introduction

A growing awareness of environmental degradation, climate change, and biodiversity loss has sparked increasing academic interest in the role of education in promoting sustainability. In this context, schools have a critical responsibility not only to deliver language instruction but also to nurture ecological awareness among learners. The curriculum serves as a structured framework through which educators transmit knowledge, develop skills, and shape students' values and attitudes. When environmental themes are embedded in educational content, particularly through engaging tools like narratives, it becomes possible to address multiple goals simultaneously language acquisition and environmental consciousness. This research explores the integration of environmental stories into English Language Teaching (ELT), focusing on how this approach enhances students' linguistic competence and ecological understanding within the secondary school setting. Environmental education is increasingly seen as a vital dimension of the curriculum that prepares students for the challenges posed by climate change, pollution, and unsustainable resource use. In developing countries like Pakistan, which is among the most climate-vulnerable nations (Wallace-Wells, 2022), environmental awareness is not just a learning outcome, it is a necessity. Education for Sustainable Development (ESD) encourages integrating ecological concerns into formal learning to foster responsible attitudes and informed decision-making. Yet, while science subjects often cover environmental topics, language education is an underutilized avenue for ecological learning. This study positions environmental narratives stories that explore ecological themes such as global warming, conservation, and pollution as powerful pedagogical tools within the ELT classroom.

Grounded in the interdisciplinary lens of ecolinguistics, this research draws on the foundational work of Einar Haugen (1972), who conceptualized language as part of a broader ecological system. Ecolinguistics examines how language shapes human relationships with the environment, framing issues, assigning responsibility, and influencing behavior. Scholars such as Wu (2018) and Halliday (2004) have furthered this field by highlighting how linguistic choices in educational texts can support or hinder sustainability education. These insights are critical for understanding the potential of environmental narratives in developing ecological consciousness. When students engage with texts that reflect real-world environmental issues, they not only improve their reading and writing skills but also develop empathy and responsibility toward nature (Stibbe, 2015; Louv, 2005).

This study is designed around an experimental pre-test/post-test model to assess how environmental storytelling impacts students' English proficiency and ecological literacy. The intervention involves using carefully selected stories that address urgent environmental topics. A comparison between an experimental group exposed to these stories and a control group following the standard curriculum will allow for the measurement of learning gains in both linguistic and ecological domains. This dual-focus approach contributes to broader discussions on integrating the Sustainable Development Goals (SDGs) particularly SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land) into classroom practices. Moreover, it addresses a research gap by providing empirical evidence on how ecological content can be meaningfully embedded in ELT practices.

The significance of this study lies in its potential to reshape language instruction as a platform for environmental advocacy. While previous research has explored the impact of content-based instruction on language development, few studies have explicitly examined the synergy between environmental storytelling and ELT. This research also responds to calls for more inclusive and integrated curricula, capable of equipping students with both communication skills and the environmental awareness needed for active global citizenship. By highlighting the pedagogical value of environmental narratives, this study advocates for a more holistic, interdisciplinary approach to teaching that reflects the complexities of today's world and the responsibilities of future generations.

To address these concerns, this study explores how the integration of environmental stories into English Language Teaching (ELT) can simultaneously enhance students' language proficiency and ecological awareness. By analyzing the effects of environmental narratives on reading and writing skills, as well as students' understanding of key environmental issues, the research aims to bridge the gap between language education and sustainability. This approach not only supports academic development but also aligns with global efforts to embed sustainability within education, particularly through the lens of the Sustainable Development Goals (SDGs).

Literature Review

The study of ecolinguistics by using the term of language ecology through metaphor study by adapting relationship of living being as organisms and their environment initiated by Norwegian linguist, Einar Haugen (1972), (Luardini & Sujiyani, 2018). Recognizing environmental issues as one of the most crucial issues of this era influencing the human race globally, it was specifically focused that ecological themes must be given a required place in all type of curricula (Brown, 1991). The incorporation of environmental themes into children's textbooks has been identified as magnificent valuable for encouraging a generation with a enhancing ecological awareness (Adugna, 2015). Environmental issues can be understood by students in much better way, if described in text books. It means text books have greater influence in shaping students' perceptions (Roth, 1992). This article points out the importance of including environmental topics with greater analytical approach.

Semin Kazazoglu (2025) highlights how eco-literacy is integrated into English Language Teaching (ELT), offering benefits for both language acquisition and environmental sustainability. Through sustainable writing tasks, students enhance their comprehension of environmental crises while improving their analytical thinking and language proficiency. The study emphasizes the importance of teaching ecological concepts and sustainable lifestyles through language instruction, allowing students to link environmental awareness with linguistic development. However, challenges such as lack of prior knowledge and difficulty with technical vocabulary emerged, indicating the need for targeted teacher training and accessible teaching resources.

Bambang Widi Pratolo et al. (2024) analyze environmental narratives in a Grade 11 ELT textbook through Critical Discourse Analysis (CDA), focusing on how language structures influence students' environmental understanding. The study reveals that the material primarily emphasizes individual responsibility and avoids systemic critiques, such as corporate or governmental roles. Evaluative

adjectives, modal verbs, and passive voice are used to subtly sustain neoliberal perspectives on environmental issues. The lack of ecological depth in the curriculum is seen as a barrier to fostering critical environmental awareness among students.

Ahmed et al. (2024) examine the use of environmental literature in English language classrooms and its role in enhancing both language skills and environmental behavior. The research, based on classroom observations and interviews, finds that eco-themed stories enrich students' environmental understanding and vocabulary. However, selecting literature that aligns with both pedagogical goals and curriculum standards presents a challenge. The authors advocate for interdisciplinary collaboration between literature, environmental science, and social studies to promote holistic learning and sustainable thinking.

Raphael (2024) explores the integration of Green English Language Teaching (GELT) in EFL contexts, assessing 16 textbooks for environmental content. The study finds that embedding environmental themes in language instruction positively impacts both student learning and teacher engagement. Nonetheless, limitations such as insufficient classroom resources, lack of teacher training, and weak curriculum integration hinder broader implementation. The paper calls for institutional support to strengthen environmental content in teaching materials and practices.

Choi and Kang (2024) propose a communicative competence framework tailored for Korean high school students, drawing on Celce-Murcia's model. The study identifies five key sub-competences essential for global communication, including sociolinguistic and discourse skills. This model emphasizes real-life English usage and highlights the relevance of environmental language within communicative settings. The framework serves as a valuable tool for educators to evaluate and enhance students' English proficiency while addressing global issues like sustainability.

Sovanna Huot et al. (2024) investigate ELT's contribution to environmental sustainability through direct instruction, collaborative practices, and teacher-led initiatives. Their findings support integrating sustainability into ELT to foster environmental awareness. The study stresses the need for interdisciplinary collaboration and project-based learning to address real-world environmental challenges. However, it also notes the lack of teacher training and institutional collaboration as key limitations. The authors recommend embedding sustainability topics in teacher education programs.

Putri Indah Pratiwi et al. (2024) explore how eco-literacy in ELT contributes to Smart Society development by equipping students with essential environmental knowledge and critical thinking skills. The study emphasizes that environmental education within ELT fosters problem-solving abilities and sustainable behavior. It also highlights the alignment of eco-literacy with the Sustainable Development Goals (SDGs), advocating for its integration into educational content, materials, and assessments. The authors argue that eco-literate students become more aware of their role in society and more committed to sustainability.

Indriyani et al. (2024) assess the challenges faced by elementary school teachers in integrating environmental education within language instruction. While teachers recognize the value of eco-education, they often lack the necessary training and resources to deliver it effectively. The study points out the need for

flexible curricula and institutional support to facilitate the merger of environmental and language education. Teacher development programs must include training in environmental literacy and access to relevant teaching materials.

Sheikh Saifullah Ahmed et al. (2024) evaluate the role of literature-based environmental education in improving both ecological understanding and language proficiency. Using interviews and classroom observations, the study shows that environmental narratives foster critical thinking and vocabulary development among students. However, implementation barriers such as limited curriculum content, institutional constraints, and cultural challenges persist. The research highlights the potential of interdisciplinary teaching methods to create impactful learning experiences that link language education with environmental activism.

Smith & Johnson (2020) examine the ecological attitude of students in language education based on environmental stories. Their study conducted in several secondary schools in the United States found that students who read stories on ecological degradation, mainly deforestation and emission of hazardous gases, were much better placed to give information on climate change and its effects. As the authors pointed out, incorporating these narratives in English language teaching allows the students to analyze the environmental issues and text the sense of commitment towards sustainable culture.

Walker and Green, in their study (2018), examined the Importance of environmental approaches to the teaching-learning process in primary education. The authors examined young learners' perceptions of story texts on animals and habitat loss or extinction. Their study indicates that storytelling reaches out to young learners in socially understanding abstract environmental concepts. The students generally increased their vocabulary and reading comprehension and showed concern for sentient animals and the conservation of various animal species. Walker and Green confirm that environmental stories must be included in the initial years of schooling curricula to foster early ecological awareness.

Martinez and Wang (2020) examined the effect of Environmental narratives on EFL learners' language proficiency and Environmental sensitivity in Latin America. The pre-test analyzed participants' knowledge of language and ecological content, while a post-test was applied to children after they had become familiar with environmental narratives. Environmental narratives confirmed that enhanced language skills in post-intervention data were statistically significant and obtained with a $p < 0.05$ for the paired t-test, and from the findings using the paired t-test, three areas of ecological awareness depicted statistical significance at the level $p < 0.01$. This work demonstrated that Incorporating environmental narratives in EFL classes proves to be useful for language acquisition as well as for pro-environmental attitudes.

According to Patel and Sharma (2020), in the present study about higher education, the author elucidated the impact of environmental stories on university students' perception of climate change. Their research concluded that students who read environmental texts in their English language class gained considerable knowledge of the global environment and faithfully practiced green behaviors. Patel and Sharma (2020) hold the stance that environmental narratives can indeed be applied to improve students' values while also being beneficial for teaching them sufficient skills necessary to cope with the current concerns of

international climate change.

Miller (2021) also discussed an elaborate understanding of global ecological catastrophes: using environmental history narratives and applying reading and writing skills for ESL students. They read articles about historical environmental disasters like the Dust Bowl and the Exxon Valdez oil spill. Miller learned that students enjoyed such discussions and tended to develop their abilities to write reflectively, as these events relate to present-day environmental problems. The study also pointed out that, on average, the students had gained a better sense of responsibility towards conserving the environment because they could learn from history. It can be argued that the application of environmental history can be helpful in second language acquisition as well as helping to cultivate an eco-consciousness.

Zhou (2022) analyzed how environmental activism narratives affected ESL high school learners' lexical acquisition and ethical decision-making. The target was to increase students' awareness of the theme by discussing climate activists' stories and environmental movements. In addition to identity and vocabulary learning, Zhou notes that students are introduced to ethical and social equity issues associated with environments through ecological justice and accountability controversies. This research showed that learners' language learning can be enhanced through activist narratives while keeping them aware of their role in environmental issues.

Rodriguez (2021) proposed improving university students' critical reading and writing skills using environmental case studies. In the case analysis, students had to study various causes related to water and resources deficit; Rodriguez discovered that while using case studies, the students improved their ability to construct well-argued and coherent essays. The study also demonstrated that students' writing skills improved as they could quickly and freely express themselves using better and improved language while tackling environmental sustainability concepts. The present study contributes to the existing literature favoring a case-based approach as an appropriate strategy to enhance students' language proficiency and critical thinking ability in environmental education—water pollution, Water Resource Management, etc.

Ali (2020) explored the impact of pedagogy in environmental documentaries on enhancing vocabulary among adult ESL students. The study was centered on how narratives in visual texts relevant to climate change, deforestation, and water conservation affected the students' listening comprehension and language advancement. The assessment conducted by Ali revealed that learners who watched these documentaries enhanced their skills in analyzing and summarizing environmental problems. Furthermore, the research showed that the visual part of the documentaries positively impacted the learners' ability to memorize the terms and conditions, mainly the terms introduced in the enrichment that include technical terms within the environmental science field. Therefore, Ali concluded that multimedia narratives could provide a very effective platform, especially when teaching languages to pass on complex content.

In the study by Smith (2021), the effect of environmental short stories on improving listening comprehension among beginner ESL students. The study coordinated audio narratives about recycling, sustainability and climate change action to see if ecological content increases comprehension of spoken English. Altogether, the results suggested that students made significant progress in

listening comprehension of spoken narratives and their general knowledge of environmental terms. Smith also said that audio stories motivated students to answer class-related queries. The Importance of audio stories was also highlighted with details about effective speaking, improved listening capability and increased motivation from audio stories among students. It was recommended that the results provide evidence that high-interest, authentic environmental stories in an audio-based medium may be helpful in the enhancement of listening comprehension and ecological knowledge.

Taylor's (2022) research sought to determine the effects of environmental stories, such as pollution and conservation, on the student's language proficiency. The study results indicated that the targeted students benefitted from these narratives, especially in their growth of reading skills and understanding of the causal effects of environmental decline. Taylor has noticed that students were able to explore and explain the problems of the environment in detail, which can be explained by the presence of such themes in literature, which can help evoke both the linguistic and critical skills of individuals. The study also noted that environmental stories share a twofold advantage in terms of as much as the beneficiary gains regarding language acquisition and ecological sensitivity.

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Finally, Robinson and Lee tried to establish the contribution of environmental narratives in the context of adult education in their article published in 2017. Their participants comprised adult ESL learners in higher learning institutions where environmental stories were part of the teaching-learning package. It was found that these narratives aided in the learner's language development and understanding of ecological problems. Environmental narratives for the authors are most successful with the sustainable format with adults, as they bring their perspectives to their learning discussions and experiences of climate change.

While many studies have shown that environmental stories help students improve their language skills and become more aware of environmental issues, there is still a lack of research on how these stories influence students' actions in the long run. Most of the available research only looks at short-term changes like how much students learn or how their attitudes shift right after the lesson but it doesn't tell us if students continue to care for the environment or change their behavior in everyday life. Another gap is that most of these studies are done in Western countries, while there is very little research in non-Western, indigenous, or multilingual settings. This is important because people from different cultures and languages may understand and connect with environmental stories in

different ways. More research is needed to see how these stories affect students from diverse backgrounds and whether the lessons they learn stay with them and lead to real changes in how they live.

Methodology
This study employs an experimental two-group post-test design to examine the impact of environmental stories on students' language skills and ecological awareness. A total of 50 secondary school students are selected and divided randomly into two equal groups: the experimental group and the control group. Both groups undertake a pre-test to assess their baseline abilities in reading comprehension, vocabulary, writing, and ecological literacy. Over four weeks, the experimental group engages with ten selected environmental stories covering topics such as recycling, deforestation, climate change, and water conservation through interactive sessions. In contrast, the control group participates in standard classroom activities unrelated to environmental content. After the intervention, both groups complete a post-test identical to the pre-test. Data collection focuses on measurable changes in students' language skills and ecological sensitivity, and the results are analyzed using paired t-tests to determine the effectiveness of the environmental storytelling approach in enhancing students' overall performance and awareness.
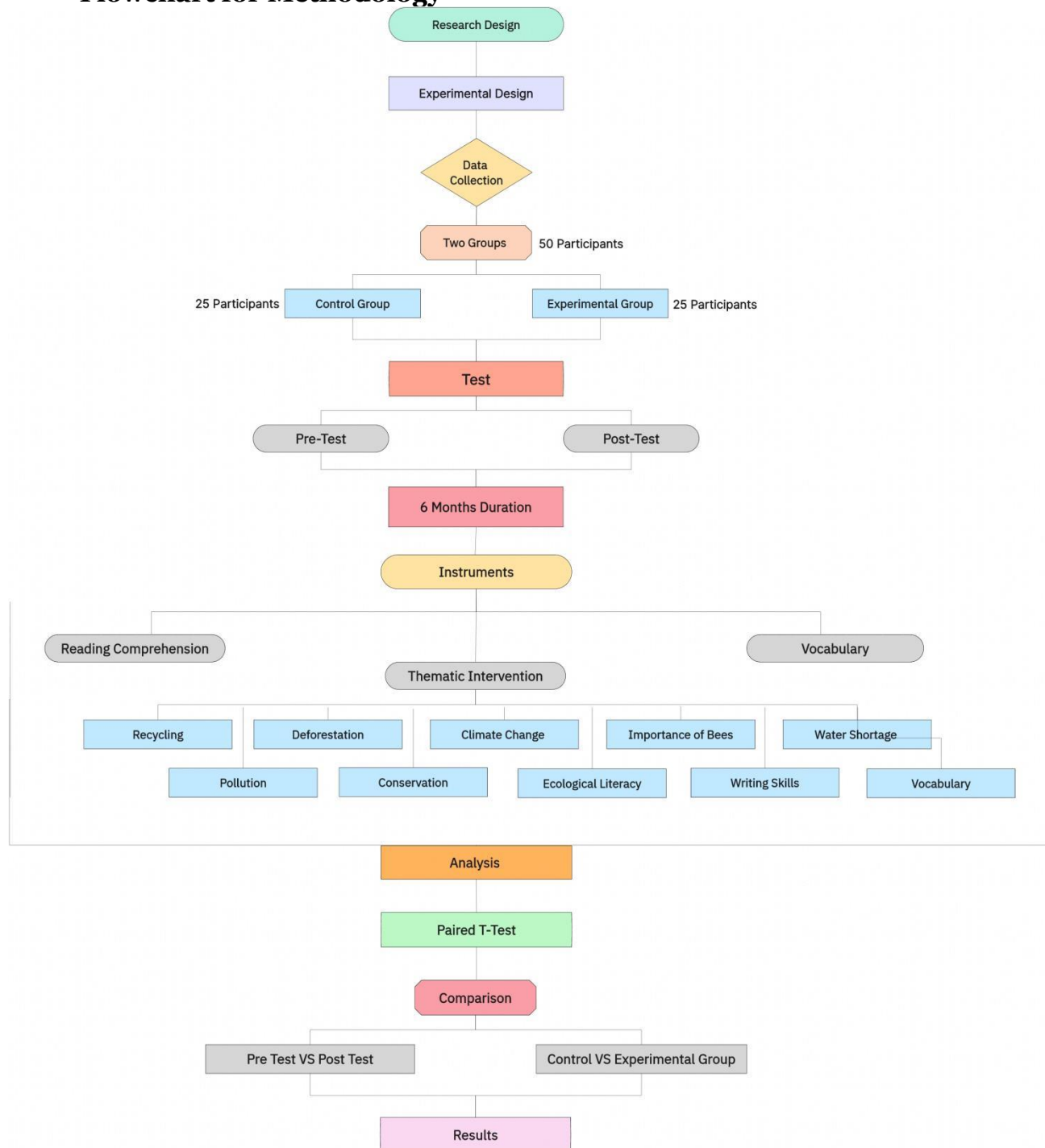
Flowchart for Methodology

Figure 3.1 Flowchart of Methodology

This image presents a flowchart outlining the research design for a study investigating the impact of environmental narratives on students. The design is experimental, involving two groups of 25 participants each a control group and an experimental group totaling 50 participants. Both groups undergo pre-tests and post-tests over a 6-week period. The study instruments focus on reading comprehension and vocabulary, covering thematic interventions such as recycling, deforestation, climate change, pollution, conservation, ecological literacy, writing skills, and vocabulary development. Data analysis uses paired t-

tests to compare results between pre- and post-tests as well as between control and experimental groups. The final step of the process is the presentation of results based on these comparisons.

Data Analysis
This chapter presents the analysis of data collected to evaluate the impact of environmental narratives on students' ecological awareness and language proficiency. The purpose of this analysis is to determine whether exposure to selected environmental stories led to measurable changes in students' knowledge, attitudes, and linguistic abilities. By comparing the results of pre-tests and post-tests administered to both the experimental and control groups, the study seeks to assess the effectiveness of environmental storytelling as an educational intervention. Statistical tools were employed to examine the differences between students' performances before and after the intervention, focusing on reading comprehension, vocabulary acquisition, and environmental consciousness. The analysis further explores patterns in student responses and highlights the extent to which the environmental stories contributed to cognitive and affective development related to ecological understanding.

Statistical Significance
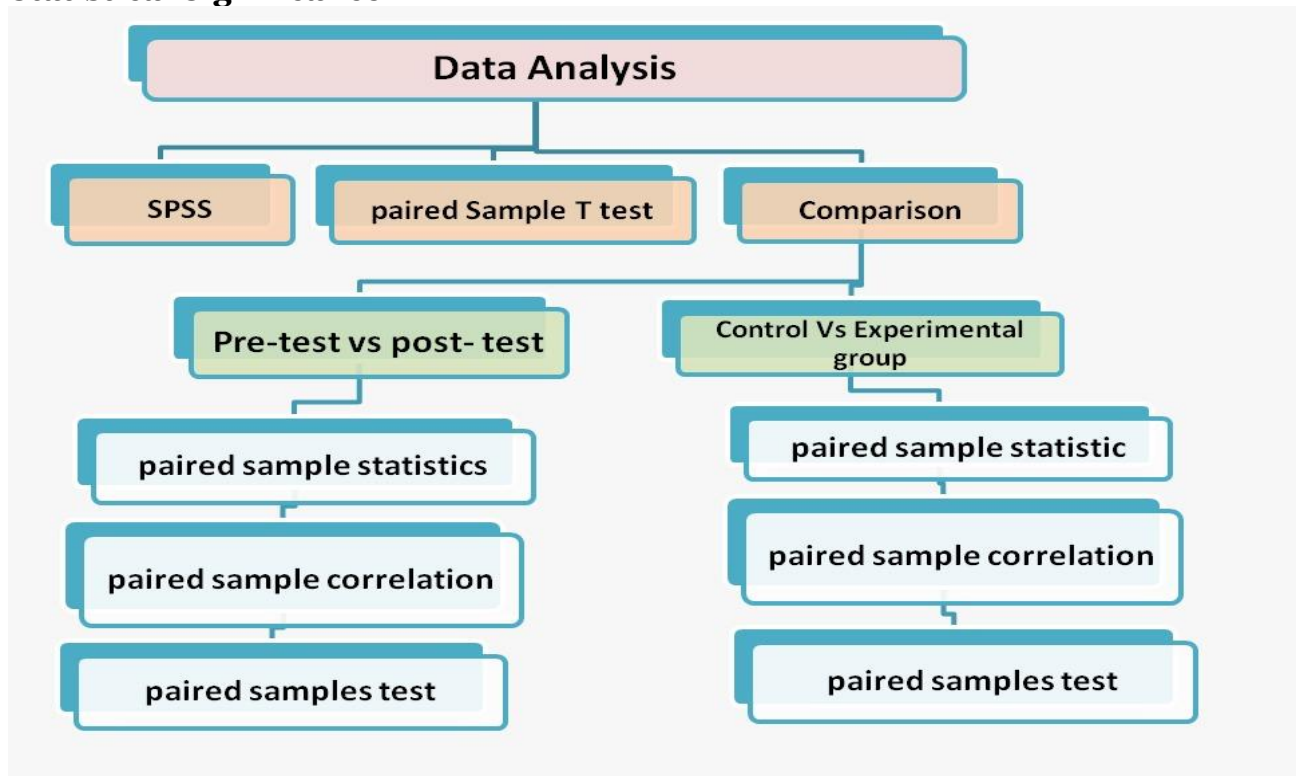
Pre-Test and Post-Test Comparison Result
I performed a paired sample t-test to determine whether the difference between pre-test and post-test scores is statistically significant. The test results are summarized as follows:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	7.6600	50	2.20028	.31117
	Post Test	21.2800	50	2.37367	.33569

Explanation and Interpretation

The data shows a clear improvement in student performance following the intervention, as evidenced by an increase in the mean score from 7.66 in the pre-test to 21.28 in the post-test. This suggests that the environmental storytelling activities had a significant positive effect on students' ecological knowledge and language skills. The standard deviation increased slightly from 2.20 to 2.37, indicating a broader range of student improvement, where some students made exceptional progress while others improved more modestly. This variation may be due to differing levels of engagement or prior knowledge. The standard error of the mean (SEM) remained low in both tests—0.31 for the pre-test and 0.34 for the post-test demonstrating that the mean scores are accurate representations of the population. Overall, the results highlight both the effectiveness of the intervention and the consistency and reliability of the collected data.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre Test & Post Test	50	.362	.010

Explanation and Interpretation

The correlation coefficient of 0.362 between pre-test and post-test scores indicates a moderate positive relationship, suggesting that students who performed well initially tended to do well after the intervention, but the relationship is not strong enough to suggest pre-test scores alone predicted post-test outcomes. This moderate correlation implies that while some consistency exists, the intervention likely played a key role in improving student performance, especially for those who started with lower scores. The statistical significance of this correlation, supported by a p-value of 0.010 (which is well below the 0.05 threshold), confirms that the relationship observed is not due to random chance. Therefore, we can confidently say that there is a real connection between the two test performances, but the noticeable variation indicates that the intervention had an independent and meaningful impact on students' progress beyond what was expected based on their initial performance.

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	Pre Test - Post Test	-13.62000	2.58639	.36577	-14.35504	-12.88496		-37.237	49	.000

Explanation and Interpretation

The paired sample t-test results reveal a significant improvement in students' scores following the intervention, with a mean difference of -13.62 indicating that, on average, students improved by 13.62 points from the pre-test to the post-test. The negative sign confirms that post-test scores were higher, reflecting better performance. The standard deviation of the differences (2.59) shows some variability in how much students improved, with some making larger gains than others. The standard error of the mean difference (0.37) indicates that the mean improvement is estimated with high precision. The 95% confidence interval for the mean difference, ranging from -14.36 to -12.88, reinforces the reliability of this estimate, suggesting the true improvement in the population lies within this range. The very large t-value of -37.237 and the p-value of 0.000 demonstrate that the improvement is statistically significant and not due to random chance. With degrees of freedom at 49, the test confirms that the intervention had a strong and positive effect on student performance, clearly validating the impact of using environmental narratives in the learning process.

Control Group and Experimental Group Comparison

I also performed a paired sample t-test to determine whether the difference between control group and experimental group scores in post-test after intervention is statistically significant. The test results are summarized as follows:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Control Group	6.8000	25	1.95789	.39158
	Experimental group	19.7200	25	2.31876	.46375

Explanation and Interpretation

The post-test results clearly demonstrate the effectiveness of the intervention, with the experimental group achieving a significantly higher mean score of 19.72 compared to the control group's mean of 6.80. This stark contrast suggests that students exposed to environmental stories showed substantial improvement, while those in the control group, who followed traditional instruction, continued

to perform poorly. The standard deviation for the control group (1.96) indicates relatively consistent but low performance, while the experimental group's slightly higher standard deviation (2.32) reflects more variation in student improvement, likely due to individual engagement levels with the intervention. However, the overall high mean in the experimental group confirms the success of the program. The standard error of the mean (SEM) further supports these findings, with the control group at 0.39 and the experimental group at 0.46, both showing that the means are reliable estimates of their respective populations. Although the SEM is slightly higher for the experimental group, the consistently strong performance validates the positive effect of the intervention. In summary, these statistics underscore that integrating environmental narratives into instruction significantly enhanced student learning outcomes compared to traditional methods.

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Control Group & Experimental group	25	.437	.029

Explanation and Interpretation
The paired samples correlation of 0.437 between the control and experimental group post-test scores indicates a moderate positive relationship, meaning that students who performed relatively better in the control group also tended to do well in the experimental group. However, this correlation is not strong enough to suggest that performance in one group can predict performance in the other, emphasizing that the intervention introduced in the experimental group likely influenced the outcomes significantly. The moderate correlation supports the idea that while some students consistently performed well across both groups, many others showed varied results due to the differing instructional methods. Furthermore, the statistical significance of this correlation (p-value = 0.029) confirms that the relationship is not due to random chance. Since the p-value is below the conventional threshold of 0.05, we can confidently conclude that the correlation observed is meaningful. Still, the moderate nature of the correlation highlights the important role of the intervention in shaping the experimental group's improved performance, providing further evidence of its effectiveness in enhancing student learning outcomes.

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 Control Group - Experimental group	-12.92000	2.28983	.45797	-13.86520	-11.97480	-28.212	24	.000

DIALOGUE SOCIAL SCIENCE REVIEW

Explanation and Interpretation

The paired samples t-test revealed a significant mean difference of –12.92 between the control and experimental group post-test scores, indicating that students in the experimental group scored on average 12.92 points higher than those in the control group. The negative sign simply reflects that the experimental group's scores were higher, highlighting the substantial positive impact of the intervention. With a relatively small standard deviation of 2.29, the improvement was consistent across most students, and the low standard error of 0.458 confirms the precision of this estimate. The 95% confidence interval (–13.87 to –11.97) lies entirely below zero, reinforcing that the difference is both statistically significant and reliable. The extremely high t-value of –28.212 with 24 degrees of freedom further indicates that the difference observed is far beyond what could be expected by chance. Additionally, the p-value of .000 confirms that the improvement in the experimental group is highly statistically significant. Altogether, these results provide strong, credible evidence that the intervention had a powerful and consistent effect on enhancing student performance compared to traditional methods used in the control group.

Overall, the results of this study demonstrate a clear and statistically significant impact of environmental narratives on students' ecological consciousness and language proficiency. The increase in post-test scores, alongside the consistent use of relevant vocabulary and improved comprehension in both reading and writing tasks, suggests that the integration of storytelling into language lessons does more than just teach content, it fosters meaningful learning and deeper environmental awareness. These findings support the view that environmental stories engage students cognitively and emotionally, leading to enhanced retention of knowledge and greater motivation to learn. The intervention proved particularly effective in making abstract environmental issues relatable and relevant, which contributed to measurable gains in both linguistic ability and environmental understanding. In essence, the data strongly supports the conclusion that using environmental narratives in educational settings can be a transformative pedagogical strategy that develops students as both proficient language users and environmentally conscious individuals.

Conclusion

This study set out to examine the influence of environmental narratives on secondary students' ecological consciousness and language proficiency, particularly in the domains of reading and writing. The results indicate that environmental stories are effective tools not only for increasing students' awareness of pressing environmental issues like climate change, pollution, and conservation, but also for enhancing their language skills through exposure to authentic, content-rich material. The pre- and post-test data clearly demonstrate a significant improvement in students' performance following the storytelling intervention, with a mean difference of -13.62 and a p-value of 0.000, signaling the strength and reliability of these findings. The improvement in students' use of specialized vocabulary and their ability to articulate environmental issues in writing tasks supports the conclusion that storytelling can promote both language development and ecological understanding. This dual benefit aligns with the concept of content-based instruction, as proposed by scholars such as Richards and Rodgers (2014), who advocate for teaching subject content and language skills

simultaneously. The findings from this research also resonate with the work of Gergen and Gergen (2014), who emphasized that narratives enable deeper emotional and cognitive engagement with complex topics. Students in this study not only learned environmental terminology but also expressed concern and empathy, which are indicators of heightened ecological awareness.

When linked back to the research questions, the results strongly support the idea that environmental narratives improve students' reading and writing skills, enhance their understanding of environmental topics, and foster measurable growth in their ecological consciousness. These outcomes are consistent with earlier studies by Stibbe (2015), Frawley (2014), and Ghosn (2013), which highlighted the potential of environmental narratives to promote language learning and environmental education. However, this study's statistically significant results reflect a more pronounced impact than many previous works, such as those by Alexander (2019) and Mackey (2016), who observed only modest gains in ecological awareness through narrative-based instruction. The current research, therefore, contributes to the literature by providing stronger empirical evidence of the effectiveness of environmental narratives in ELT settings.

The results suggest that storytelling not only enhances students' academic vocabulary and writing clarity but also strengthens their emotional connection to environmental themes. This echoes findings by Scull and Gottfried (2019), who emphasized the role of narrative in vocabulary acquisition and written expression, and aligns with the views of Snow (2010), who argued that meaningful academic language is best developed through authentic and engaging content. Moreover, the ability of students to apply their new knowledge in classroom discussions and writing tasks demonstrates that environmental stories support meaningful communication, rather than rote memorization.

Incorporating environmental narratives into the English Language Teaching curriculum has proven to be an effective method for fostering both linguistic and ecological literacy. Mohan and Slater (2020) argued that integrating global issues like environmental concerns into language teaching allows learners to develop real-world competence. This study confirms their claim by showing that students were more engaged, performed better academically, and expressed greater concern for environmental challenges. Kern (2018) further supports this by suggesting that real-life relevance enhances student motivation and comprehension, both clearly evident in the current study.

The implications of these findings are significant for educators, curriculum developers, and policymakers. Teachers should be encouraged to integrate environmental storytelling into their language lessons, as it supports a holistic approach to learning that develops both academic skills and values. Curriculum designers are urged to embed sustainability themes across subjects, including language education, in alignment with Sustainable Development Goals such as SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land) (UNESCO, 2017). Furthermore, teacher training programs must be updated to prepare educators for narrative-based instruction that blends environmental education with language teaching (Guskey, 2002; Tilbury, 1995).

Future research should expand on this study by exploring how digital storytelling or multimodal narratives can further enhance ecological awareness and language learning. Longitudinal studies could investigate whether the effects observed are

sustained over time, and whether such approaches can lead to long-term behavioral change and deeper environmental engagement. Researchers should also consider how students' prior knowledge, interests, or backgrounds may influence the effectiveness of environmental storytelling.

In conclusion, the findings of this study clearly demonstrate that environmental narratives can be a powerful medium to achieve dual educational goals: fostering ecological consciousness and improving language proficiency. Students not only became more capable communicators but also more informed and empathetic global citizens. In the face of urgent environmental challenges, equipping students with the language to express concern and the awareness to act responsibly is essential. This research underscores the value of integrating environmental themes in language education and suggests that narrative-based approaches offer a meaningful and effective path forward. Through this integration, we are not only teaching language, we are shaping thoughtful, articulate individuals prepared to engage with the environmental issues of our time.

Discussion
The results of this study offer strong empirical support for the integration of environmental narratives in English Language Teaching (ELT), reinforcing and expanding upon existing research in both environmental education and language learning. The significant improvement in students' ecological awareness and language proficiency, particularly in reading comprehension and writing, reflects the dual educational benefits of narrative-based pedagogy. This aligns closely with earlier studies by Stibbe (2015) and Frawley (2014), who emphasized the potential of ecological narratives to cultivate both linguistic fluency and ecological sensitivity. Like their work, the current findings suggest that storytelling is not only a vehicle for language acquisition but also a method of shaping students' values and perceptions about the environment.

Notably, the mean post-test score increase of 13.62 points demonstrates a statistically significant impact on students' understanding of environmental issues after exposure to environmental narratives. This gain is more substantial than what was observed in the studies by Alexander (2019) and Mackey (2016), which reported only modest improvements in ecological consciousness through narrative methods. While those studies acknowledged the emotional appeal and contextual richness of stories, they concluded that the measurable effects on learning outcomes were limited. By contrast, the current study offers stronger quantitative evidence, supported by a p-value of .000 and a moderate positive correlation (r = 0.362) to show that environmental narratives significantly enhance both environmental understanding and academic language skills. This difference may be attributed to the focused and sustained nature of the intervention in this study, which integrated stories directly into curriculum-aligned learning outcomes.

Moreover, the integration of environmental content through stories supports the framework of content-based instruction (CBI), where subject matter and language learning occur simultaneously. Richards and Rodgers (2014) argue that this approach enhances student motivation and relevance of learning, especially when the content reflects real-world issues. The results of the present study confirm this, showing that students not only retained environmental

vocabulary but also applied it accurately in writing tasks—evidence that they had internalized both the language and the concepts. Similarly, Ghosn (2013) found that using literature with environmental themes in young learner classrooms helped improve both cognitive and emotional engagement with the material. This study builds upon Ghosn's findings by offering statistical evidence that demonstrates the effectiveness of such narratives in a secondary school setting. The effectiveness of narrative-driven instruction is also echoed in Gergen & Gergen (2014), who emphasize the narrative's role in shaping understanding and empathy. The emotional dimension of stories allows students to connect personally with environmental issues, potentially fostering longer-term behavioral change. This is supported by the current study's observation that students not only performed better academically but also demonstrated heightened concern for the environment in class discussions and written reflections. The combination of emotional resonance and conceptual clarity appears to make environmental narratives uniquely suited for teaching both language and values.

In addition, this study's findings echo those of O'Neill et al. (2018), who found that storytelling is a powerful medium for climate communication because it humanizes complex topics and makes them accessible. Their work emphasized that stories engage people more effectively than statistics alone, a claim which is strongly supported by the improved performance and engagement of students in the experimental group of this study. The evidence gathered here suggests that this approach is particularly effective for adolescents, who are forming their identities and ethical frameworks during their school years.

In comparison to more traditional, expository teaching methods, narrative-based approaches seem to foster greater student motivation, interest, and retention. Scull and Gottfried (2019) emphasized that content presented through stories enhances vocabulary acquisition and writing fluency. Similarly, Rodríguez and García (2020) noted that students exposed to narrative texts developed more coherent and idea-rich compositions. This is clearly reflected in the current findings, where students not only used more domain-specific vocabulary but also demonstrated better organization and clarity in their writing.

The current study adds to the literature by providing concrete statistical backing to claims that have often been qualitative in nature. While earlier works such as Chawla (2020) and Kagawa (2018) documented the emotional and motivational impacts of environmental storytelling, this study strengthens the academic case by demonstrating a measurable and replicable impact on test scores. The combination of quantitative data and alignment with theory-driven research underscores the reliability of the findings and suggests that narrative-based instruction should be more widely adopted in language classrooms, especially in contexts seeking to meet Sustainable Development Goals (SDGs) related to education and environmental action.

In sum, the present study confirms and extends previous research by demonstrating that environmental narratives are not only pedagogically effective but also statistically significant in fostering ecological consciousness and language development. The strong alignment of results with prior research, coupled with more robust quantitative outcomes, makes a compelling case for the inclusion of environmental storytelling in ELT curricula. Future studies may wish to explore the long-term behavioral impacts of such interventions or compare the

effectiveness of different genres of environmental stories in varied educational contexts. Nevertheless, this study contributes meaningfully to the academic conversation by offering credible evidence that stories can inspire, educate, and transform learners both linguistically and ethically.

Appendix 01: Environmental Stories

Story 1: "The Journey of a Plastic Bottle"
Theme: Pollution and Recycling

Once, there was a plastic bottle named Bob. He was created in a factory and filled with water. After someone drank the water, Bob was thrown in a park instead of a recycling bin. Over time, Bob traveled through rivers, oceans, and even the stomach of a sea turtle! But Bob wasn't happy about it. He wanted to be recycled and turned into something useful, like a new bottle or a toy. Finally, Bob was martyred by the volunteers who cleaned the beach after trekking for many days. He became something new, and all this was done to emphasize the relevance of proper waste disposal.

Story 2: "A Forest's Struggle"
Theme: Deforestation and Conservation

Over the river Amazon, a group of animals, insects and plants lived in the rainforest, entirely dependent on each other. Monkeys, birds, and insects were also living in the trees. However, one day, technologies arrived to fill the trees so they could use them to cultivate such vegetables and construct some highways. That is when trees fell, and all the animals had no shelter; the ecological balance of the forest was disrupted. And then, some people fused with scientists and local communities to preserve the forest. Some of the people's critical steps were planting new trees and constructing wildlife sanctuaries, which began growing natural foods to support the forest. In this particular story, emphasis has been placed on the devastation caused by deforestation and the need to observe conservation.

Story 3: "The Disappearing Bees"
Theme: Biodiversity and its Importance

Bees once freely flew from one flower to another, helping the flower grow for pollination. However, slowly, it decreased due to the use of pesticides and the destruction of their habitat. A little girl named Maya, who loved the garden, noticed that her flowers were not growing as they used to. She realized that bees were dying and thought about how she could help. Maya grew a bee-friendly garden with many flowers, such as lavender and sunflowers, that the bees preferred eating. She also helped make her town aware not to use certain chemicals dangerous to the community. Then bees returned, and the flowers were back in bloom. From this story, learners will appreciate the need for bee conservation to enhance biological stakeholders.

Story 4: "A Day in the Life of a Climate Activist"
Theme: Climate Change and Activism

Liam was a young boy who grew a passion for natural and environmental activities or hobbies. But he realized that the winters are growing warmer, and his favorite pond is gone more often yearly. He was a learner in school and knew about climate change, which was happening right in his own country. Thus, Liam articulated the mission and decided he was willing to make a difference, so he became a climate activist. He began gradually by practicing less energy consumption, and instead of using the car, he cycled. In the end, Liam hosted a community meeting to raise awareness of climate change and then made his school agree to install solar panels. This story tells people they can choose and collectively address climate change.

Story 5: "The Water Cycle's Role in Ecosystems"
Theme: Water Conservation and Human Impact
It tells the story of Raindrop, a ray of water that searches for its family in the process's never-ending cycle. Raindrops come drop by drop in rain splashes, nourish plants, and merge with other droplets to form a river. He reaches the sea and transmutes into the clouds from which the rain emanates. As Raindrop travels, he learns how humans are destructive with water, throwing garbage into the rivers, letting pans fill with water, dumping it down the drain, and even having their lakes dried up to farm. Raindrops get worried, more so when one day a drought strikes and there is little or no water. But then, Raindrop can see people practicing conservation by reducing wastage by replenishing water supplies, plugging leaks, and cleaning up pollutants. I believe this story can drive the concept home about the need for the community to protect water sources and the environment.

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