

## ARTICLE

# Analyzing EFL Learners' Learning Needs in Developing the Ecoliteracy-Based Teaching Materials in Reading Skills

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## ABSTRACT

This study addresses the challenge of enhancing both linguistic competence and environmental awareness among undergraduate learners. With growing concerns about environmental issues, there is a critical need for educational models that integrate ecoliteracy with language learning. The study investigates learners' needs in developing an ecoliteracy texts-based instructional model that incorporates metacognitive skills to improve reading abilities. Using a mixed-methods approach with a sequential explanatory design, the research involved 264 undergraduate students from various universities. Data were collected through questionnaires, interviews, and metacognitive tests, with statistical analysis performed using SPSS and qualitative analysis for interview data. The findings reveal that learners require ecoliteracy texts focusing on waste management, climate change, nature conservation, and environmental pollution. Integrating these topics into reading materials is vital for two main reasons: they enhance learners' understanding of critical environmental issues and improve their language skills. The study suggests that incorporating ecoliteracy into reading curricula not only boosts linguistic proficiency but also fosters environmental awareness and critical thinking. Educators are encouraged to adopt this approach to create a more comprehensive and relevant learning experience, equipping students to be both proficient readers and environmentally conscious individuals. This model represents a solution to the dual challenges of language learning and environmental education.

**Keywords:** Learning Needs; Ecoliteracy; Text-Based Learning; Metacognitive Skills; Reading Skills

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# 1. Introduction

English Language Teaching (ELT) occupies a central role in education, not only in teaching language skills but also in addressing significant global challenges such as environmental sustainability. The integration of environmental instruction into ELT, particularly within reading lessons, represents a critical intersection of language learning and ecological consciousness<sup>[1]</sup> This approach enriches learners' comprehension and interpretation skills while simultaneously cultivating eco-literacies. These eco-literacies are essential as they extend beyond classroom learning, contributing to the development of responsible and environmentally conscious individuals<sup>[2]</sup>. Through such integration, ELT serves as a dynamic force in nurturing individuals who are well-equipped with both linguistic competence and the knowledge necessary to contribute to environmental sustainability<sup>[3,4]</sup>.

The integration of environmental themes into the ELT curriculum, particularly through reading materials that cover topics like climate change, pollution, deforestation, and other ecological concerns, has been shown to be highly effective. This method not only enhances learners' language proficiency but also significantly contributes to their overall cognitive development, including their writing and speaking skills<sup>[4]</sup>. Moreover, this approach encourages critical thinking and increases environmental awareness, providing a more holistic educational experience. By merging ELT with sustainability-focused content, educators can address both language acquisition and the broader cultural and ecological identities of their students, thereby fostering a more conscientious, culturally informed, and ecologically aware cohort of learners<sup>[5,6]</sup>.

Despite the demonstrated benefits of integrating ecoliteracy into ELT, the development of learners' environmental literacy within these classes requires deliberate attention and focused effort. Successful ELT strategies for environmental instruction often include content-based learning and task-based teaching. These methodologies not only advance language proficiency but also serve as platforms for fostering ecoliteracy. The instructional materials used in these contexts are carefully designed to enhance language skills while also imbuing learners with a deeper understanding of environmental issues<sup>[7]</sup>. However, it is important to note that the integration of ecoliteracy into ELT pedagogy is still relatively scarce, indicating a limited emphasis on the inter-

section of language learning and environmental education within academic discourse. This gap highlights the need for further exploration and development in this domain to fully address the intersectionality of language acquisition and ecological awareness within educational contexts<sup>[8]</sup>.

The current study is motivated by the necessity to explore learners' needs in developing a reading instructional model based on ecoliteracy texts. This approach is underpinned by the understanding that contemporary education must actively engage with pressing environmental issues. The imperative to integrate ecoliteracy into ELT is well-supported by scholars such as Maijala<sup>[4]</sup>, who argue that educational paradigms should not only focus on linguistic and communicative proficiency but also demonstrate a strong commitment to engaging with environmental concerns. This dual focus serves to provide additional empirical evidence supporting the efficacy of incorporating ecoliteracy into ELT instructional models while also emphasizing a profound dedication to addressing environmental challenges<sup>[9,10]</sup>. In this context, learners are strategically positioned to assume social responsibility as they enhance both their ecological understanding and English language skills. The activities designed to improve English proficiency are thus interwoven with opportunities for learners to contemplate and respond to the intricate relationship between language use and environmental responsibility. This fusion of language learning and ecological consciousness represents a holistic educational approach that aligns with the evolving imperatives of global citizenship and sustainable development.

The instructional activities developed in the present study focus on the incorporation of ecoliteracy texts into reading classes. Recognizing the significant role of ecoliteracy knowledge in modern education, the researchers strategically used reading classes as a platform to impart ecoliteracy texts to learners. This instructional approach is designed to concurrently enhance both reading skills and environmental insight. The underlying premise is that learners must possess proficient reading skills and be exposed to materials that specifically foster environmental awareness to effectively engage with ecoliteracy texts. Bland<sup>[1]</sup> highlights the importance of learners' background knowledge in reading comprehension, emphasizing that learners benefit significantly from drawing on their pre-existing knowledge related to the subject matter of the text. Therefore, in the

context of ecoliteracy texts, the instructional design not only emphasizes the development of proficient reading skills but also integrates learners' background knowledge related to environmental themes to scaffold their comprehension<sup>[11,12]</sup>. These integrative learning activities are envisioned to holistically contribute to the development of learners' ecoliteracy, fostering a synergistic relationship between reading proficiency and environmental awareness in the ELT landscape.

To effectively comprehend ecoliteracy texts, learners must master both linguistic and non-linguistic dimensions<sup>[13,14]</sup>. As they engage in reading activities, learners perform three key tasks: decoding the text, building text-related information, and constructing a reader-model. These tasks interact synergistically, supported by sufficient linguistic knowledge and non-linguistic dimensions. Sudiatama et al.<sup>[15]</sup> suggest that learners with strong linguistic competence are better equipped to comprehend reading texts. Additionally, learners can use their metacognitive competence to analyze each sentence or paragraph, identifying the main ideas of the texts<sup>[16,17]</sup>. Therefore, developing an instructional model for teaching reading skills based on ecoliteracy texts that integrates learners' metacognitive skills is crucial. This model would facilitate both language proficiency and environmental awareness within the ELT framework.

However, instructional models that integrate metacognitive skills with the teaching of reading skills based on ecoliteracy texts are currently limited. The emphasis on metacognitive skills is crucial because these skills enable learners to reflect on, monitor, and control their own reading comprehension processes<sup>[18]</sup>. In response to this gap, the current study aims to develop an ecoliteracy texts-based reading instructional model that integrates metacognitive skills to improve learners' reading abilities. The study is guided by two main research questions: What are the learners' learning needs and target needs in developing an ecoliteracy texts-based reading instructional model integrated with metacognitive skills? And What should an ecoliteracy texts-based reading instructional model integrated with metacognitive skills look like to effectively improve learners' reading skills? The novelty of this study lies in its utilization of ecoliteracy education as a model for learning English reading skills, with particular attention to learners' metacognitive skills during reading activities.

The integration of ecoliteracy into ELT, particularly

through the development of reading instructional models that incorporate metacognitive skills, represents a significant advancement in both language education and environmental awareness. By addressing learners' linguistic and non-linguistic needs, and by fostering critical thinking and ecological consciousness, such instructional models can provide a more comprehensive and relevant learning experience. This approach not only equips students with the necessary language skills but also prepares them to be environmentally conscious and responsible global citizens. As the demand for sustainable education grows, the intersection of ELT and environmental education will continue to be a crucial area for research and development, offering valuable insights and practical strategies for educators worldwide.

## 2. Materials and Methods

### 2.1. Research Design

The study employed a mixed-method approach, specifically utilizing a sequential explanatory design<sup>[19]</sup>, to achieve a comprehensive understanding of the subject matter under investigation. This methodology was selected to balance quantitative and qualitative data, offering a nuanced perspective on the research topic. The study primarily focused on a quantitative analysis, examining learners' learning needs and target needs through data collected via a questionnaire administered to the participants. The quantitative data were presented in a percentage format, enabling a clear and concise representation of the numerical findings. Complementing the quantitative analysis, qualitative data were also gathered, providing a more holistic view of the subject. The integration of these two data types allowed for a thorough exploration of the learning processes involved in implementing ecoliteracy texts-based reading skills integrated with metacognitive skills. The qualitative data were presented in the form of words and sentences, facilitating an in-depth examination of the materials and methods used in the learning process. This combination of quantitative and qualitative approaches provided valuable insights into the effectiveness and implications of integrating ecoliteracy texts-based reading skills with metacognitive skills within the educational context. By leveraging both data types, the study offered a well-rounded analysis, contributing to a deeper understanding of the educational strategies employed.

## 2.2. Participants

The study aims to delve into the learning and target needs of learners, specifically focusing on the development of an effective instructional model for enhancing their reading skills within the context of ecoliteracy text-based materials. To accomplish this goal, the study engaged participants from the English language education study programs across various universities in West Nusa Tenggara, located in Eastern Indonesia. The research participants consisted of a total of 264 undergraduate learners who were carefully selected to ensure demographic and academic equivalence. This careful selection process aimed to minimize potential confounding factors that could influence the research outcomes. The criteria for equivalence included factors such

as age, university level, grade point average, and course type. By controlling for these variables, the study sought to isolate the impact of the instructional model and its effectiveness in improving reading skills among this specific group of learners. In essence, this research seeks to address the pressing need to enhance reading skills through an ecoliteracy text-based instructional model by examining the learning and target needs of a well-matched group of undergraduate learners from diverse universities in West Nusa Tenggara, Eastern Indonesia. This systematic approach to participant selection and research design is critical to ensure the validity and reliability of the study's findings and conclusions. The demographics of the research participants can be presented in **Table 1**.

**Table 1.** Demographics of the Research Participants.

Demographic Variable	Description
Age	Participants are of similar age ranges.
University Level	Undergraduate students from various levels.
Grade Point Average	Participants have comparable GPAs.
Course Type	Engaged in similar English reading courses.
Total Participants	264

## 2.3. Data Collection Technique

The study's methodology employed a comprehensive approach, integrating both quantitative and qualitative data to gain a deep understanding of the learning and target needs of English language learners. The quantitative aspect was primarily driven by a meticulously designed questionnaire and metacognitive tests, tailored specifically for this research. The questionnaire was distributed in a digital format using Google Forms, which facilitated accessibility and ease of completion. The target audience comprised English language learners enrolled in English language education programs across various universities, ensuring a diverse and representative sample.

The questionnaire was structured to extract detailed information about the learners' needs and was divided into three key sections: necessities, lacks, and wants. The "necessities" section included eight questions, each offering 5–6 selectable options, aimed at identifying the essential elements required by learners for their language education. The "lacks" section consisted of four questions, with each providing 5–6 options, to pinpoint gaps in the current learning process.

The "wants" section, although smaller with just two questions (each with 4–5 choices), sought to understand learners' aspirations and preferences in their language learning journey. This structured approach ensured that the questionnaire covered all dimensions of the learners' requirements comprehensively. The second instrument employed for quantitative data collection was a metacognitive test, designed to assess key indicators of learners' abilities in monitoring, regulating, and controlling their cognitive processes, motivation, and behavior. These areas are fundamental to understanding how learners manage their learning processes and adapt to various educational challenges. The metacognitive test was rigorously evaluated for validity and reliability to ensure it accurately measured the intended metacognitive abilities of the learners. Validity ensures that the test measures what it is supposed to measure, while reliability ensures consistency in the test results over time. By focusing on these critical aspects, the study aimed to ensure that the metacognitive test provided accurate and consistent insights into the learners' metacognitive competencies, thereby strengthening the overall research findings.

To complement the quantitative data, the study also

incorporated a qualitative dimension, using interviews as the primary method of data collection. The interview process was carefully structured and guided by a set of well-prepared interview guidelines, ensuring that the discussions remained focused and aligned with the study's objectives. A select group of experts, each specializing in a specific area relevant to the study, was engaged for these interviews. These experts represented diverse yet interconnected fields, including English language teaching, instructional model design, language assessment, curriculum and materials development, reading instruction, educational evaluation, and textbook development. The diversity in their expertise ensured that the qualitative data collected was comprehensive, covering all aspects of ecoliteracy and text-based reading instruction.

## 2.4. Data Analysis Technique

The study employed a methodical approach to data analysis, utilizing the Software Package for Social Sciences (SPSS) to analyze the data collected from the questionnaire and metacognitive tests. The choice of SPSS was deliberate, given its proficiency in providing accurate and comprehensive statistical information. The software was particularly selected for its ability to present data in various user-friendly formats, such as tables, percentages, and graphical tools, which are essential for comparing data sets and identifying patterns or trends within the data. The descriptive statistical analysis conducted using SPSS allowed the researchers to delve deep into the dataset, uncovering intricate details and insights that might have otherwise been overlooked. This advanced statistical capability ensured that the analysis was not only precise but also comprehensible, facilitating a clearer understanding of the findings and their implications for the study.

In addition to the quantitative analysis, the study also incorporated a qualitative analysis of the data gathered from the interview activities. This qualitative analysis was conducted through a multi-stage process, designed to ensure a thorough and insightful examination of the interview data. The first stage in this process was data condensation, where the raw interview data were meticulously reviewed and organized. Data condensation involves sifting through large amounts of raw data to distill it into more manageable and focused segments. This process is critical for identifying

key themes, patterns, and insights, allowing researchers to eliminate redundant or irrelevant information and ensure that the analysis remains centered on the most pertinent and significant aspects of the data. Following data condensation, the next stage was data display. During this stage, the condensed data was organized into formats that facilitated easier analysis and interpretation. This organization could involve the creation of matrices, flowcharts, or other visual tools that systematically arrange and present the data. The purpose of data display is to make it easier to compare and understand relationships within the data. By visually organizing the information, researchers can more effectively identify patterns, discrepancies, and connections, enhancing the overall analysis process.

The final stage in the qualitative analysis was verification and drawing conclusions. This stage involved rigorously scrutinizing the displayed data to ensure its accuracy and reliability. Researchers engaged in critical thinking and reflection to assess the validity of the patterns and themes identified in the earlier stages. Verification is crucial for ensuring that the conclusions drawn from the data are grounded in solid evidence and accurately represent the interviewees' perspectives. After this rigorous verification process, researchers proceeded to synthesize the findings into coherent insights, drawing conclusions that significantly contribute to the study's objectives. This systematic approach to both quantitative and qualitative data analysis ensured a comprehensive and reliable examination of the research data, ultimately leading to well-founded conclusions and actionable insights.

## 3. Results

### 3.1. Research Findings of Learning Needs

This study seeks to answer the research questions of what the learners' learning needs and target needs are in developing an ecoliteracy texts-based reading instructional model integrated with metacognitive skills and what the ecoliteracy texts-based reading instructional model integrated with metacognitive skills is able to improve learners' reading skills. In this study, learning needs comprise necessities, lacks, and wants. The result of the learning needs can be presented in **Table 2**.

**Table 2.** Learners' Learning Needs Dealing with Necessity of Ecoliteracy Texts-Based Instructional Model.

Aspects of Learning Needs	Very Necessary		Necessary		Unnecessary		Very Unnecessary		Total Resp.
Necessities	Total	%	Total	%	Total	%	Total	%	
In your opinion, should you read the types of texts on the following topics in the Reading Course?									
a Texts relating to climate change	81	30.7	167	63.3	16	6.1	0	0	264
b Texts relating to forest protection	102	38.6	150	56.8	12	4.5	0	0	264
c Texts dealing with waste management	135	51.1	116	43.9	13	4.9	0	0	264
d Texts relating to Environment pollution	100	37.9	139	52.7	15	5.7	10	3.8	264
e Texts dealing with urban development	94	35.6	153	58	15	5.7	2	0.8	264
Do reading texts in reading courses need to contain the following environmental topics to help you improve your vocabulary mastery?									
a Climate change	95	36	156	59.1	13	4.9	0	0	264
b Nature conservation	91	34.5	155	58.7	18	6.8	0	0	264
c Waste management	110	41.7	142	53.8	12	4.5	0	0	264
d Green building design	84	31.8	149	56.4	31	11.7	0	0	264
e Environment pollution	83	31.4	152	57.6	20	7.6	9	3.4	264
Do you need to master other English skills to support your reading skills?									
a Listening Skills	195	73.9	67	25.4	2	0.8	0	0	264
b Speaking Skills	216	81.8	46	17.4	1	0.4	1	0.4	264
c Writing Skills	192	72.7	71	26.9	1	0.4	0	0	264
In your opinion, what kind of reading learning materials do you need to improve your reading skill?									
a Book or novel	127	48.1	129	48.9	8	3	0	0	264
b Digital reading	84	31.8	170	64.4	10	3.8	0	0	264
c Academic reading texts	108	40.9	147	55.7	9	3.4	0	0	264
d Multimodal texts	56	21.2	183	69.3	25	9.5	0	0	264
In your opinion, do you need to continue developing the following aspects in your reading activities to improve your reading skills?									
a Vocabulary mastery	215	81.4	47	17.8	2	0.8	0	0	264
b Grammar competence	174	65.9	86	32.6	4	1.5	0	0	264
c Reading strategies	162	61.4	99	37.5	3	1.1	0	0	264
d Metakognitive	100	37.9	152	57.6	12	4.5	0	0	264
In your opinion, what kind of reading learning materials do you hope to improve your reading skills?									
a Simple reading texts	125	47.3	136	51.5	2	0.8	1	0.4	264
b Texts equipped with pictures	121	45.8	124	47	19	7.2	0	0	264
c Texts with a list of translated vocabulary	151	57.2	97	36.7	16	6.1	0	0	264
d Texts with videos	105	39.8	130	49.2	27	10.2	2	0.8	264
In your opinion, what kinds of reading skills do you need to master reading skills to complete assignments in Reading class?									
a Ability to understand the meaning of a text as a whole	164	62.1	98	37.1	2	0.8	0	0	264
b Ability to make inferences	127	48.1	131	49.6	5	1.9	1	0.4	264
c Ability to understand a text in depth.	138	52.3	118	44.7	8	3	0	0	264
d Ability to adapt reading style and strategies	117	44.3	138	52.3	9	3.4	0	0	264
What kind of reading learning activities in Reading class do you need?									
a Individual	91	34.5	152	57.6	19	7.2	2	0.8	264
b Pair discussion	125	47.3	131	49.6	7	2.7	1	0.4	264
c Small group discussion (2–4 members)	123	46.6	123	46.6	15	5.7	3	1.1	264
d Large group discussion (4–7 members)	82	31.1	112	42.4	63	23.9	7	2.7	264

**Table 2** presents compelling data indicating that learners have a significant need to enhance their reading skills through texts focused on ecoliteracy. This table categorically highlights the specific ecoliteracy issues that learners are keen to explore. These issues encompass a broad range of environmentally significant topics, such as climate change, forest protection, environmental pollution, urban management, and waste management. The importance of incorporating these topics into reading course materials is underscored by the dual benefits they offer. Firstly, they serve as an effective medium for improving learners' ecoliteracy knowledge, enriching their understanding of critical environmental con-

cerns. Secondly, the integration of these ecoliteracy themes into reading curricula supports the enhancement of various language competences. This includes not only the improvement of other language skills but also the development of grammatical competences, the adoption of more effective reading strategies, and the elevation of reading metacognitive awareness. The inclusion of these issues in teaching materials is thus not only essential for fostering environmental awareness and responsibility among learners but also for advancing their overall linguistic and cognitive skills.

In the pursuit of enhancing their reading skills, **Table 2** showed that learners have expressed preferences for spe-

cific methods that aid in comprehending reading texts. These methods include the integration of pictures and videos into the reading material, as well as the inclusion of translated vocabulary. Such additions are not merely supplementary; they are considered vital reading activities that significantly facilitate the learners' ability to grasp the overall meaning of a text. Furthermore, these strategies play a crucial role in developing the ability to make inferences from the text. By having access to multimedia resources and translated terms, learners can better infer meanings and themes that are not

explicitly stated, thus deepening their comprehension. Additionally, these resources enable learners to adapt and refine their reading styles and strategies, catering to diverse learning preferences and cognitive styles. In the realm of classroom management, there is a clear indication of the learners' need for varied discussion formats to complement their reading practice such as pair discussions, small group discussions, and individual reading sessions. After showing learners' necessity, the researchers found out their lacks and wants as well. **Table 3** presents learners' lacks and wants as follows.

**Table 3.** Learners' Learning Needs Relating to Lack and Wants of Ecoliteracy Texts-Based Instructional Model.

Aspects of Learning Needs	Very Good		Good		Sufficient		Low		Total Res.
Lacks	Total	%	Total	%	Total	%	Total	%	
How well can you master your current English skills?									
a Listening Skills	36	13.6	100	37.9	94	35.6	34	12.9	264
b Speaking Skills	47	17.8	103	39	78	29.5	36	13.6	264
c Reading Skills	43	16.3	142	53.8	57	21.6	22	8.3	264
d Writing Skills	33	12.5	118	44.7	66	25	47	17.8	264
How well do you think you have mastered the following English text reading skills?									
a I can comprehend a text as a whole.	34	12.9	131	49.6	73	27.7	26	9.8	264
b I can make inferences of a text.	33	12.5	109	41.3	89	33.7	33	12.5	264
c I can read a text with full concentration	35	13.3	103	39	92	34.8	34	12.9	264
d I can adapt reading styles and strategies.	31	11.7	114	43.2	82	31.1	37	14	264
How well do you think you apply the following strategies for reading English texts?									
a Active reading strategy	49	18.6	121	45.8	74	28	20	7.6	264
b Skimming strategy	37	14	118	44.7	69	26.1	40	15.2	264
c Intensive reading	30	11.4	112	42.4	86	32.6	36	13.6	264
d Reading with initial questions	29	11	107	40.5	94	35.6	34	12.9	264
How well do you think you did in the following English text reading activity?									
a Authentic/Genuine texts	39	14.8	97	36.7	98	37.1	30	11.4	264
b Altered texts	25	9.5	110	41.7	91	34.5	38	14.4	264
c Adapted texts	45	17	107	40.5	91	34.5	21	8	264
d Minimal/Incidental texts	40	15.2	124	47	83	31.4	17	6.4	264
Wants									
The following are aspects that you might want in learning to read English texts.									
a To improve vocabulary acquisition	216	81.8	48	18.2	0	0	0	0	264
b To improve grammar competence	204	77.3	59	22.3	1	0.4	0	0	264
c To improve communicative competence	204	77.3	56	21.2	3	1.1	1	0.4	264
d To improve reading strategies	189	71.6	73	27.7	1	0.4	1	0.4	264
e To improve writing skills	192	72.7	69	26.1	3	1.1	0	0	264
f To improve reading comprehension	198	75	64	24.2	2	0.8	0	0	264
The following are reading strategies that you might want to master in learning to read English texts in reading courses.									
a Active reading strategy	144	54.5	117	44.3	3	1.1	0	0	264
b Skimming strategy	129	48.9	127	48.1	8	3	0	0	264
c Intensive reading	128	48.5	125	47.3	11	4.2	0	0	264
d Reading with initial questions	118	44.7	129	48.9	16	6.1	1	0.4	264

**Table 3** offers a detailed presentation of the areas where learners are currently lacking in terms of their English skills, specifically focusing on their reading strategies and familiarity with various text types. The data extracted from this table

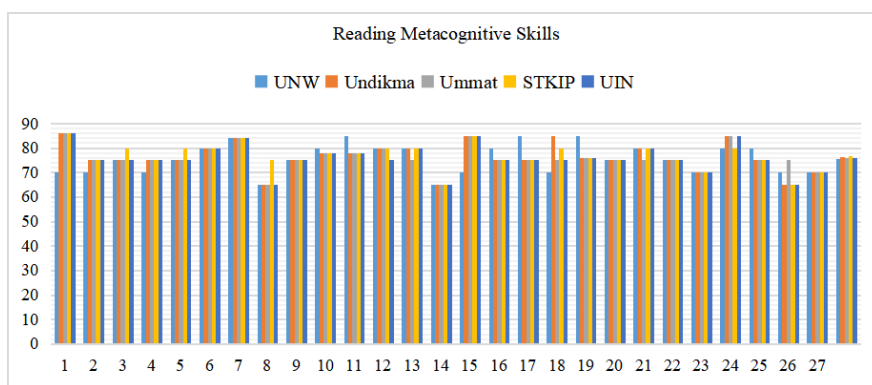
reveals several key areas of deficiency among the learners. Primarily, it shows a noticeable gap in their knowledge of effective reading strategies. This lack of understanding of how to approach different texts is coupled with challenges in reading comprehension, particularly in grasping the full scope and nuances of the reading material. Additionally, learners seem to struggle with recognizing and understanding various types of texts, which is crucial for applying appropriate reading strategies. Another significant area of concern highlighted by the data is the learners' ability to make inferences from implied information in texts. The data showed that learners find it challenging to read between the lines and extract such implied information. For instance, many learners feel that they do not engage in active reading strategies effectively. The indicators of this deficiency are quite evident; learners reported that they struggle to create notes from the texts they read. Note-making is a fundamental part of active reading as it involves summarizing, questioning, and connecting ideas. Additionally, these learners find it difficult to retell or summarize the information from the text. This inability to retell not only points to a lack of comprehension but also suggests a gap in their ability to process and internalize the information read.

**Table 3** not only highlights the areas where learners currently lack in their English skills but also sheds light on their desires and preferences (wants) regarding the implementation of an ecoliteracy texts-based reading instructional model. The learners expressed a keen interest in enhancing their reading skills, and they have specific goals in mind to achieve this enhancement. They aspire to attain a high level of vocabulary mastery, which is fundamental in understanding and engaging with complex texts. Alongside vocabulary, they recognize the importance of having sufficient grammatical competences. Mastery in grammar aids

in the correct interpretation of texts and contributes to their overall language proficiency. In addition to these language-specific skills, the learners also emphasize the need for strong communicative competences. Good reading strategies are another area of focus for the learners. They understand that having a strategic approach to reading can greatly enhance their comprehension and retention of the material. Reading comprehension and writing skills are also on their list of desired improvements. These skills are interrelated, as good reading comprehension forms the basis for effective writing. The learners are aware that understanding the text deeply is essential for them to be able to write about it coherently and critically. To achieve these goals, the learners have expressed a desire for specific types of reading activities to be incorporated into their learning process. They want to be engaged in active reading activities, which involve interacting with the text through annotating, questioning, and summarizing. Skimming and intensive reading activities are also desired, as they help in quickly grasping the main ideas and in a detailed understanding of the text, respectively.

### 3.2. Reading Metacognitive Skills

After finding out learners' learning and target needs, the researchers distributed metacognitive instruments to see learners' metacognitive skills. In doing so, researchers are assisted by English reading lecturers who took reading courses at each university. The lecturers are asked to distribute metacognitive tests in reading. Of 264 research participants, 27 participants are involved in metacognitive tests in five private universities in West Nusa Tenggara, Eastern Indonesia. Based on the statistical analysis, the data on metacognitive skills can be presented in **Figure 1** as follows.



**Figure 1.** Reading Metacognitive Scores.



The current study, detailed in **Figure 1**, investigates the metacognitive skills of learners in reading courses across five universities, selected based on their National Accreditation Ranking. This selection criterion ensures that all participating institutions share the same quality of national ranking, providing a level playing field for the assessment. In each reading class, 27 learners were involved to gauge their metacognitive abilities. The findings reveal that the University of NW scored 75.6, Undikma scored 76.4, Ummat and STKIP both scored 76, while UIN recorded a score of 75.8. These results indicate that, on average, learners possess good metacognitive skills,

underscoring the effectiveness of the reading courses offered by these universities in enhancing such abilities.

### 3.3. Ecoliteracy Texts-Based Reading Instruction

After finding out the metacognitive skills, researchers investigate how the ecoliteracy texts-based reading instruction improves learners' reading skills. The data were collected in interview activities with reading lecturers. The data can be presented in **Table 4** as follows.

**Table 4.** Results of Interview Activities on Ecoliteracy Texts-Based Reading Instruction.

Aspects of Teaching Steps	Lecturers' Responses
Organizing the text	... the process begins with organizing the text, a stage where educators emphasize the importance of presenting information in a manner that resonates with students' prior knowledge and interests. This initial step sets the groundwork for deeper engagement .... it's about making the text accessible and relatable, which encourages students to dive deeper...
Outlining the text	... making an outline of the text involves students identifying the main ideas and supporting details, effectively mapping out the text's structure. These activities are crucial for enhancing students' analytical skills...., it is also highlighting the transition from passive reading to active analysis ...
Interpreting the text	... interpreting the text is where students begin to engage more critically with the content, drawing on their own experiences and knowledge... to make sense of the environmental issues presented.... this phase fosters a deeper level of thinking and discussion among students, with one teacher reflecting,... It's fascinating to see students connect the dots and bring their insights into the conversation...
Reflecting the text	... allowing students to consider the implications of what they've read on both a personal and global scale.... this is where the real learning happens... students start to see themselves as part of the larger ecological system and understand their role in it...
Concluding the text	... involves synthesizing the information and insights gained through the previous stages... Teachers can highlight the importance of this phase in helping students articulate their understanding of ecoliteracy... articulates its relevance to their lives... it can help students consolidate their learning and take away meaningful lessons about environmental stewardship...

The findings from the interview clearly illustrate that ecoliteracy texts-based instruction serves as a potent educational tool, enhancing not only students' reading abilities but also their environmental awareness. This instructional method transcends the traditional focus on the linguistic components of reading, such as vocabulary and grammar, to incorporate a broader, more integrative approach. Students are engaged with texts that delve into environmental issues, connecting these topics directly to their own experiences and the world around them. Such an approach to reading instruction is pivotal in fostering a dual outcome: it sharpens students' ability to decode and comprehend texts while simultaneously deepening their understanding of environmental matters. This dual focus is particularly relevant in today's educational context, where

the need for environmental stewardship is increasingly emphasized. By integrating environmental content into reading lessons, educators can cultivate a sense of ecological responsibility among students, alongside improving their literacy skills. Moreover, the interview results underscore the significance of making learning relevant to students' lives. The incorporation of environmental issues into reading instruction not only enhances cognitive engagement with texts but also stimulates emotional and personal engagement. This relevance is key to fostering a deeper, more meaningful learning experience. Students are not merely passive recipients of information; rather, they become active participants in their learning process, connecting the dots between their reading skills and their understanding of and responsibility toward the environment.

## 4. Discussion

The present study explores the efficacy of an ecoliteracy texts-based instructional model, emphasizing the integration of environmental themes with metacognitive awareness to enhance learners' reading skills. This approach responds to the dual demands of language education and sustainable development by embedding ecological content into English Language Teaching (ELT). Its core aim is not merely to strengthen reading comprehension but also to foster critical ecological consciousness among learners. Central to this framework is the role of lecturers in selecting and tailoring texts that align with students' learning needs and social realities. As Chen<sup>[20]</sup> notes, the choice of texts—ranging from climate change to nature conservation and environmental pollution—plays a pivotal role in sustaining engagement and ensuring meaningful learning. Such topic diversity underscores the model's potential to stimulate curiosity, support contextualized reading practices, and cultivate a deeper understanding of the relationship between language and the environment.

The instructional strategies deployed within this model highlight the active involvement of learners in processing ecological texts. Instead of passive absorption, students are encouraged to reflect on their comprehension processes, thereby enhancing their ability to analyze, evaluate, and synthesize information<sup>[21–23]</sup>. Through activities such as structured questioning, summarizing, and peer discussion, ecoliteracy texts not only strengthen reading proficiency but also instill critical thinking skills applicable to real-world environmental challenges. Jodoin<sup>[24]</sup> affirms that reading proficiency can be advanced when texts are ecologically situated, as they compel learners to interrogate pressing global issues and apply linguistic insights to sustainable practices. This dual focus positions students not only as language learners but also as informed citizens equipped to contribute constructively to ecological problem-solving.

Within ecoliteracy-based pedagogy, emphasis is placed on organizing and engaging with texts in ways that sharpen comprehension and analytical depth. Selected texts on climate change, waste management, and conservation serve as scaffolds for contextual understanding<sup>[25–27]</sup>. Learners are prompted to recall information, recognize textual features, and structure key ideas—a process that deepens both comprehension and memory retention<sup>[28–31]</sup>. As Sudiatama<sup>[15,32,33]</sup>

emphasizes, organizing texts is not an arbitrary activity but a crucial pedagogical moment in which educators make content accessible while encouraging learners to connect with prior knowledge. This structured engagement ensures that reading materials resonate with personal experience and ecological realities, thereby enhancing relevance and urgency in learning<sup>[23,34,35]</sup>.

Engagement with ecoliteracy texts also nurtures metacognitive development by prompting learners to consciously reflect on their reading strategies. Seedanont and Pookcharoen<sup>[23,34,35]</sup> observe that this reflective practice is vital for enhancing the ability to evaluate and synthesize ideas. Learners are encouraged to outline texts, extracting main ideas and supporting details as a means of reinforcing analytical precision<sup>[36–38]</sup>. Outlining serves as more than a reading exercise; it is a cognitive training activity that fosters structured thinking and coherence in expression<sup>[39–41]</sup>. In line with Allen and Hancock<sup>[23,34,35]</sup>, such practices promote lifelong habits of critical inquiry and adaptability, preparing students to navigate both academic challenges and environmental complexities. By embedding these metacognitive strategies into ecoliteracy instruction, lecturers provide learners with tools that extend beyond the classroom, equipping them with transferable skills for broader contexts of learning and decision-making<sup>[2,42]</sup>.

The interpretive dimension of ecoliteracy texts further reinforces critical engagement, as learners are guided to examine the meanings, implications, and real-world connections of ecological content. This process enables them to link abstract concepts with personal experiences, thereby deepening relevance and encouraging transformative thinking<sup>[24,43]</sup>. Interpretation is not limited to individual comprehension but extends to collaborative dialogue, fostering collective construction of knowledge and shared insights<sup>[44–46]</sup>. As Aziz et al.<sup>[21]</sup> highlight, interpretive tasks cultivate higher-order thinking, pushing learners to move beyond surface-level understanding. This collaborative and reflective engagement transforms classrooms into spaces of active inquiry, where environmental literacy and communicative competence grow in tandem. In this way, learners are prepared to function as critical global citizens who can approach ecological challenges with informed perspectives and constructive solutions<sup>[1,11]</sup>.

Finally, the integration of ecoliteracy texts into higher

education reading curricula extends its benefits beyond comprehension to support writing development. Studies indicate that exposure to ecologically themed texts introduces learners to diverse vocabulary, grammar, and rhetorical structures, all of which contribute to improved written expression<sup>[26]</sup>. The reflective phase of this instructional model reinforces the interplay between reading and writing, encouraging learners to analyze linguistic forms alongside ecological content<sup>[7]</sup>. This dual attention enhances their capacity to decode sophisticated texts while simultaneously shaping their ability to articulate environmental arguments with clarity and precision. As a result, ecoliteracy texts cultivate both linguistic repertoire and ecological insight, underscoring the transformative potential of language education in advancing sustainability agendas<sup>[9,40]</sup>. In doing so, the model equips learners with the intellectual and communicative resources to not only understand but also advocate for solutions to pressing environmental challenges.

## 5. Conclusions

The findings of this study highlight the crucial role of ecoliteracy texts in enhancing learners' reading skills while simultaneously fostering environmental awareness and responsibility. By identifying learners' necessities, lacks, and wants, the study demonstrates that integrating themes such as climate change, waste management, nature conservation, and pollution into reading materials is not only relevant but necessary for building linguistic competence and ecological consciousness. The incorporation of metacognitive strategies further strengthens this model, enabling learners to monitor, regulate, and reflect upon their reading processes, thereby improving comprehension and critical thinking. The results affirm that ecoliteracy-based instructional models serve as a bridge between language learning and sustainable education, positioning learners to become both proficient English users and environmentally conscious individuals.

Moreover, this research underscores the broader pedagogical implications of merging language education with sustainability-oriented content. The ecoliteracy texts-based instructional model with integrated metacognitive skills offers educators a structured approach to address the dual challenges of linguistic proficiency and ecological awareness. By engaging learners in reflective and active reading practices,

the model promotes deeper comprehension, analytical ability, and personal responsibility toward environmental issues. As higher education institutions seek to prepare students for global citizenship, the study advocates for the adoption of such innovative teaching models to nurture future leaders who are not only competent in language use but also capable of contributing to sustainable solutions. This dual emphasis on language and ecology reinforces the transformative potential of English Language Teaching (ELT) as a vehicle for both academic growth and ecological stewardship.

## Author Contributions

Conceptualization, H.H., I.M.P.U., D.S., and L.A.I.; methodology, H.H.; software, I.M.P.U.; validation, H.H., D.S. and I.M.P.U.; formal analysis, H.H. L.A.I., and I.M.P.U.; investigation, D.S.; resources, H.H.; data curation, L.A.I. and D.S.; writing—original draft preparation, H.H.; writing—review and editing, H.H., L.A.I. and D.S.; visualization, I.M.P.U.; supervision, D.S.; project administration, H.H. and I.M.P.U.; funding acquisition, H.H., D.S., L.A.I., and I.M.P.U. All authors have read and agreed to the published version of the manuscript.

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## Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board.

## Informed Consent Statement

Participation in this study is entirely voluntary. By agreeing to take part, the participants acknowledge that they have been informed about the purpose, procedures, poten-

tial risks, and benefits of the study. Participants understand that their identity are kept confidential and that all information they provide are used solely for research purposes. They have the right to withdraw from the study at any time without any penalty or loss of benefits to which they are otherwise entitled. By continuing, they give their informed consent to participate in this research under the conditions described.

## Data Availability Statement

The data utilized in this study cannot be made publicly available due to strict adherence to privacy concerns and ethical obligations that safeguard participant confidentiality. This ensures compliance with ethical research standards and data protection regulations. However, researchers or interested parties who require access to the dataset for validation or further analysis may request it. Such requests will be considered on a case-by-case basis and must be deemed reasonable. Importantly, approval from the appropriate institutional ethics review board is mandatory before any data can be shared, to ensure that the proposed use aligns with ethical guidelines and participant consent terms.

## Conflicts of Interest

While preparing this manuscript, the authors utilized ChatGPT as a language tool to assist in proofreading, refining grammar, and enhancing the clarity of English expressions.

The authors confirm that they have no known conflicts of interest related to this publication.

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