

DEVELOPMENT OF ECOLINGUISTIC-BASED ARGUMENTATION TEXT TEACHING MATERIALS TO STRENGTHEN ECOLOGICAL LITERACY OF JUNIOR HIGH SCHOOL STUDENTS

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ABSTRACT

This paper proposes an ecolinguistics-based framework for developing argumentative writing materials to support ecological literacy among junior secondary school students. It employs a conceptual design approach through a focused narrative reading of literature on ecolinguistics, argumentation, language learning materials, and education for sustainable development. The ADDIE framework organizes the proposed development procedures, while the present work is limited to conceptual analysis, instructional design, and prototype specification. The resulting design connects local environmental issues with critical examination of lexical choices, framing, agency, and the visibility of affected living beings. Learning activities guide students to evaluate sources, construct claims supported by evidence and reasoning, address counterarguments, and revise their texts. Two separate assessment rubrics are proposed for argumentative writing and ecological literacy to avoid treating language proficiency as equivalent to environmental understanding. The paper contributes a transparent link between discourse analysis, writing instruction, and ecological reasoning in Indonesian language and literature education. Expert validation, classroom feasibility, and learning effectiveness remain to be investigated empirically.

Keywords: *ecolinguistics; argumentative writing; teaching materials; ecological literacy; junior secondary school*

INTRODUCTION

Argumentative text learning provides space for students to express opinions, assess information, and account for reasons. In the context of environmental problems, these skills are needed so that students can distinguish invitations that are merely persuasive from evidence-supported proposals. The problem of school waste, water use, or reduced green space can be used as a learning context that is close to students' lives. However, the proximity of the theme does not automatically result in an understanding of the human relationship with the environment.

This article places ecological literacy as the ability to understand ecological linkages, critically assess environmental information and representations, consider the interests of affected parties, and formulate accountable actions. The operational definition is used to design activities and assessments, not as a claim that a single measurement framework has been universally applied. Its orientation is

related to the educational goals for sustainable development that emphasizes informed decision-making and responsibility to the environment and society (UNESCO, 2017).

Ecolinguistics provides a basis for examining how language shapes human relationships with the ecological world. Stibbe (2021) discusses stories constructed through language, among other things, through framing, evaluation, deletion, and prominence. In junior high school teaching materials, the concept can be adapted into simple questions: who performs the action, who experiences the impact, what environmental elements are mentioned, and what is not visible in the text? This adaptation allows students to relate linguistic forms to the consequences of meaning.

For example, the sentence "garbage piles up on the yard" states the situation, but does not explain the perpetrator or the process that caused the buildup. The sentence "visitor leaves food packaging on the yard" presents the perpetrator more clearly. This distinction does not mean that the passive form or dismissal of the perpetrator is always wrong. Students need to check whether the perpetrator is known, whether evidence is available, and how language choices affect the division of responsibility. Critical reading must still maintain the accuracy of the information.

The development of language teaching materials also requires alignment between objectives, texts, activities, and evaluation. Tomlinson's (2012) review places material development as a field related to language learning principles and the use of materials in learning. In this article, this alignment is applied by selecting environmental texts that students can read, providing assistance to understand technical terms, and directing the reading towards argumentative writing.

The design problem addressed is that there is no operational relationship between language analysis in environmental texts, argument structuring, and ecological literacy assessments in the proposed design. This article does not claim that all previous studies ignore these relationships. Establishing a broader empirical gap requires a systematic literature search. The contribution offered is traceability design: each ecolinguistic concept is linked to a learning task and an assessment indicator that can be examined.

The purpose of this article is to formulate the principles of the development of teaching materials, to develop a prototype of ecolinguistic-based argumentative text activities, and to determine an assessment that distinguishes the quality of argumentation from ecological literacy. The focus is on the design for junior high school students, with grade VIII as the proposed initial target. Adjustments to the curriculum and school characteristics must be made prior to implementation. The development question is how language choices and evidence-based reasoning can be combined to support students' ecological understanding and responsibility.

METHODS

This article uses a conceptual design approach with a directed narrative reading of relevant theoretical sources and studies. Core sources include ecolinguistics (Stibbe, 2021), argumentation (Toulmin, 2003), language material development (Tomlinson, 2012), learning design (Branch, 2009), and education for sustainable development (UNESCO, 2017, 2020). The study of Ardoin et al. (2020) is used as context to discuss caution in linking environmental learning to conservation outcomes. This reading is not a systematic review and is not intended to represent all related publications.

The design procedure consists of determining concepts, translating concepts into learning indicators, preparing the sequence of activities, and matching assignments with assessments. Information is recorded in a matrix containing sources, key concepts, pedagogical implications, and application limits. Compatibility between components is checked through tracing of the relationship between objectives, activities, student products, and assessment indicators. The check is the consistency of the design, not expert validation or evidence of effectiveness.

ADDIE is used as an advanced development framework as it includes analysis, design, development, implementation, and evaluation (Branch, 2009). The scope of this article is limited to conceptual analysis, design, and initial prototype specifications. Needs analysis in schools, expert validation, readability tests, classroom implementation, and evaluation of learning outcomes have not been conducted. Therefore, no number of participants, validity scores, or statistical results have been reported.

At the planned needs analysis stage, the instruments include student questionnaires, teacher interviews, review of teaching materials, and writing diagnostic tasks. The questionnaire asks about the experience of reading environmental texts, difficulties distinguishing facts and opinions, and the need for writing assistance. The interview examines the appropriateness of time, access to resources, and learning constraints. The selection of schools and participants needs to consider permissions, class characteristics, and trial objectives; the number of samples should be determined based on the final test design chosen.

Proposed materials are in the form of printed or digital modules, authentic, transparently tailored texts, language analysis sheets, source examination sheets, and rubrics. Texts are selected based on source traceability, accuracy of information, readability, proximity of issues, and diversity of viewpoints. Simplification must not alter causal relationships or omit important information. Each text should include a source, date, and explanation if it has been adapted.

Follow-up validation is planned to involve language learning skills, ecolinguistics or environmental education, as well as the design of teaching materials. Expert assessments should include content accuracy, construct consistency, readability, and feasibility of activities. Classroom testing requires the approval of the school and parents or guardians as per the provisions, protection of student identity, and written assessments with the same guidelines. If effectiveness is tested, design with a peer group and initial ability check is more informative than simply comparing before and after scores in a single class.

RESULTS AND DISCUSSION

Results of conceptual design

The results presented are in the form of teaching material specifications and examples of activities. The main principle is that students not only study the environment as a topic, but also examine the way the environment is presented through language. A unit is seen as ecolinguistically based when the relationship between language choice, representation of actors and affected parties, and ecological assessment appears explicitly in the activity.

Table 1 shows the relationship of concepts, activities, and proposed evidence of learning. The categories of analysis are simplified for the needs of junior high school; this table is not the standard instrument of Stibbe (2021). Teachers can introduce terms through concrete questions before using analytical labels.

Table 1. Mapping Ecolinguistic Concepts in Teaching Materials

Focus	Student activities	Proof of learning
Word choice and evaluation	Compare the terms "vacant land" and "habitat".	Explanation of the influence of designation on assessment.
Framing	Compare two texts on packaging reduction.	Identify the focus of benefits, costs, and impacts.
Actors and responsibilities	Marking who took the action.	The description of the perpetrator is based on available evidence.
Removal and prominence	Inspect unnamed parties or living beings.	Critical questions about the impact that is neglected.
Ecological reasoning	Assess the solution and its possible subsequent impact.	Arguments with reasons and limits of application.

The initial prototype took up the issue of single-use packaging in schools. The learning objectives were for students to be able to state claims, select relevant evidence, explain the relationship between evidence and claims, respond to objections, and consider ecological and social impacts. The structure of the argumentation adapts Toulmin's (2003) ideas, especially claims, grounds or evidence, linking reasoning, and responses to possible exceptions. Technical terms are used gradually so as not to burden novice readers.

Table 2 summarizes the design of four meetings, each of which has two hours of lessons according to the school setting. The duration is a design proposal and needs to be tested. The number of words in the final essay is also flexible; the initial range of 300–400 words can be adjusted according to diagnostic results, teacher support, and accessibility needs.

Table 2. Argumentation Unit Design on Single-Use Packaging

Meetings	Focus of the activity	Products
1	Reading two texts; assessing sources; distinguishing facts, opinions, and uncertain information.	Notes on sources and issues.
2	Analyze the choice of words, actors, and affected parties; Compile causal relationships.	Critical Reading Sheet.
3	Compile claims, evidence, reasons, objections, and alternative solutions.	Framework and draft argument.
4	Assess a friend's draft; improve arguments and language; reflect on action choices.	Final writing and reflection.

The following material fragment is an artificial example for a classroom activity, not a citation of a source or field data: "Single-use packaging makes food purchases more practical. However, this convenience needs to be compared to the amount of packaging thrown away and the school's ability to manage it. Packaging reduction should be accompanied by an affordable option for students and merchants." Students are asked to identify implied claims, information that is still needed, interested parties, and possible objections to the proposal.

Its directing questions include: is practicality sufficient to justify the use of packaging; what data is needed to assess the amount of waste; who bears the cost of the alternatives; and do all alternatives have the same impact? Students are not directed to accept a single conclusion before examining the evidence. They may support gradual reduction, reuse, or other options as long as the reasons, limitations, and consequences are explained.

Writing assistance is provided in the form of sentence outlines: "I propose ... because ..."; "This evidence supports the proposal through ..."; and "The objection to this proposal is ..., so ...". The framework is reduced as students become more independent. Peer checks are directed at the relevance of the evidence and the clarity of reasoning, not just spelling. Students are also asked to mark statements that still require sources so as not to turn conjecture into fact.

Assessment design

The assessment separates argumentative ability and ecological literacy as summarized in Table 3. Separation is necessary because fluent writing does not always indicate ecological understanding, whereas good comprehension can be hampered by writing ability. Both constructs can be examined through the same writing, but their scores and interpretations are reported separately. Ecological knowledge can also be checked through short answers or oral explanations.

Table 3. Proposed Assessment Dimensions

Construct	Dimensions	Indicator
Argumentation	Claims and organization	The position is clear; the ideas are coherently arranged.
Argumentation	Evidence and reasoning	Traceable sources; reasons linking evidence and claims.
Argumentation	Objections and language	Respond to objections; language is precise and easy to understand.
Ecological literacy	Ecological linkages	Explain the causes, impacts, and relationship of humans with the environment.
Ecological literacy	Critical reading	Assess framing, actors, and neglected parties.
Ecological literacy	Action considerations	Considering the impact, feasibility, fairness, and limitations of solutions.

Each dimension can be developed on a scale of 1–4 with a specific descriptor. Examples for evidence and reasoning: a score of 1 if the claim is not supported by evidence; a score of 2 if the information is used but the relevance or source is unclear; a score of 3 if the evidence is relevant and the logical relationship is explained; a score of 4 if the sources and limitations of the evidence are

examined and the reasoning supports the claim consistently. These descriptors still require expert judgment and calibration of the assessor.

For the dimension of action consideration, score 1 indicates an unjustified call; score 2 indicates one reason with unexplained consequences; score 3 indicates a comparison of ecological impacts and feasibility; score 4 indicates an alternative comparison that considers affected parties and limited information. Approval of a particular environmental message is not the basis for scoring. The assessment focuses on the quality of consideration, not the similarity of opinion with the teacher.

Discussion and limitations

This design connects three processes: critical reading of environmental representations, testing the relationship of evidence to claims, and consideration of the consequences of actions. These relationships are pedagogical propositions that need to be tested. Language analysis is expected to help students recognize textual viewpoints; evidence testing helps them avoid hasty conclusions; solution comparisons provide room to assess ecological as well as social consequences. This article has not shown causal relationships between these processes.

The use of local themes is in line with UNESCO's (2020) focus on learning and action at the local level. However, the proximity of the issue is not enough if the task only asks students to repeat the slogan. Units need to make room for questions, differences of interest, and information-based decisions. Implementation in schools also requires attention to the affordable alternatives and the real conditions of school residents so that environmental responsibility is not simply imposed on individuals.

The contribution to Indonesian Language and Literature Education lies in strengthening language learning as an activity of understanding and assessing socio-ecological meaning. The accuracy of vocabulary, the relationship between sentences, and the structure of arguments are studied along with their representational functions. Teachers can assess students' reasons when choosing certain sentence forms or terms. Thus, language reflection becomes part of directed writing learning, not an additional theme outside of the language purpose.

The design also avoids equating text quality with behavioral change. The review Ardoin et al. (2020) examined the contribution of environmental education to conservation outcomes; this linkage requires attention to the form of the program and the evidence of the results. In this development, the improvement in writing scores only supports claims about writing. Changes in ecological understanding need to be measured separately, while behavioral changes require appropriate observation and follow-up.

The limitations of the article include unsystematic reading of the literature, the lack of data on school needs, the lack of validation of rubrics, and the lack of classroom testing. Packaging examples also do not guarantee suitability for all contexts. The next priority of research is needs analysis, expert assessment, readability tests, prototype revisions, and learning tests. Effectiveness tests should report on initial ability, group equivalence, assessment consistency, effect size, and generalization limits.

CONCLUSION

The development of ecolinguistic-based argumentation text teaching materials is formulated through an explicit relationship between language choice, environmental representation, evidence, reasoning, and action considerations. The conceptual output of this article includes the principles of development, the design of the four-meeting unit, examples of material fragments, and the dimensions of separate argumentation and ecological literacy assessments. The design provides the basis for the development of Indonesian language teaching materials in junior high schools, but has not proven its feasibility and effectiveness. Strengthening ecological literacy remains a goal that must be tested through validation and classroom research.

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