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ECOLOGICAL CONTENT ANALYSIS IN BOHLKE'S SKILLFUL READING AND WRITING

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Abstract
Ecology has long been a part of processes in current education. Hence it has become gentle evidence that the instillation of ecological values has been carried out extensively and thoroughly to students. One of the ecological promotion media is textbooks. This study aimed to analyze the ecological content of reading materials and instructions in the Skillful Reading and Writing book – a compulsory student book in the Critical Reading and Writing I course. Reading materials and instructions were on the analysis from the aspects developed by Rule and Atkinson (1994) namely appreciation of nature, realistic ecological problems, positive tone, appropriate illustrations, and hope for a solution. This study belongs to qualitative descriptive research with document study data collection techniques. The content analysis results revealed - at least - half of all readings in the book treat the natural environment. Of the five ecological aspects, they could be sorted according to the degree of conformity, namely positive tone (4.9), appreciation of nature (4.05), realistic ecological problems (4.15), appropriate illustrations (3.5), and hope for a solution (2.0). However, not all those selected readings are supplemented with learning instructions leading to real actions to preserve and appreciate environments. Therefore, teachers should make a purposively instructional adjustment to students' conservation practices.

Keywords**:** content analysis, ecology, reading and writing

Introduction
Ecology as a term is not such a novelty – or Indonesian mostly say *barang baru* – in the field of education. What is being addressed is not specific to ecological education but particularly about the existence and significance of ecological contents and concerns in education generally. This is included in the historical development of how ecological values have been introduced to schools - educational institutions or institutions of education (Bronfenbrenner, 2005; Krasny, 2020; Pranoto, 2022). This ends up with a strategy that ecology can be acquired and instilled from an early age of people. In particular, it has become gentle evidence that the instillation of ecological values has been carried out extensively and thoroughly by education.

Another substantiation of the presence of ecology in the world of education is evidenced by the commitment to equipping teachers with both ecological values and education. This was supported by Monroe and Krasny in 2016, Simmons and Monroe (2021), and Yuce in 2019. In his research, he argued that "It is of great importance that teacher candidates are trained to develop an awareness of ecology and to protect ecological systems because they are the ones who will educate future generations."

To know the strategic plans for the future of ecology in education, Salazar et al. (2022) presented that education's resilience was about being committed to providing ecological education, or environment-based education, until 2040. This was further strengthened by the determination to include environmental learning materials in curricula up to secondary school levels or K12. They delivered some alternatives to get into this educational goal, namely training, marketing, funding, and partnership.

Ecology in education gave rise to several terms; one of them is namely classroom ecology. Classroom ecology is about "Represent the complex system of relationships among students and their teachers within the academically and socially oriented classroom environment" (Justice et al., 2022). This is an approach so that education becomes a new home for the initiation of ecological values for humans in general (McCrea, 2006).

Another familiar ecological term used in education is environmental education. According to Blanchet-Cohen and Reilly (2013), Bodor (2016), and Connor (2014) environmental education has described a set of instructions that informs students about their environment and teaches them how to make wise decisions about how to care for it. This typical education opens an incredible opportunity for creating ecologically proficient understudies that will both precede their commitment to caring for the environment into their grown-up lives (Potter, 2009).

The obvious question now is what is the importance of studying ecology for students? According to research results by Blumstein and Saylan (2007), students must have a close relationship with and insight into nature. Students who do not have an emotional connection with nature are unlikely to understand nature, understand human relationships with nature, and show behaviour to protect nature (Kahyaoğlu et al., 2021).

There are many ways to present ecological values to students in the world of education. Activities that are meaningful as non-curricular activities are often opportunities for ecological values to be conveyed. The activities of caring for plants and cleaning the school environment of trash are also part of the daily routine of students that can be done to cultivate ecological values within themselves (Maharramli et al., 2021).

In the curricular realm, there is not much that can be done to make students love the environment. One example is biology lessons. In other subjects, there are many ways that ecological values can be conveyed to students through media and instructions. One of the ecological promotion media is textbooks (Martin et al., 2022).

Other implementations of ecological education in schools, among others, are as follows (Anwari, 2010):

1. Applying the "environmental teaching" model from Finger (Germany) or the "real life" model from Ligthart (Netherlands).
2. Ecological-oriented education can contain competencies about: individuals and populations, interactions and interdependencies, environmental influences and limiting factors, energy flows and nutrient cycles, communities and ecosystem concepts, homeostasis, succession, humans as members of ecosystems, and ecological implications for activities humans and society.
3. Organizing teaching about the natural environment, developing a critical attitude and caring for the environment in students, caring for the environment, and utilizing the environment as a learning resource.
4. Ecological education can be carried out using an ecological character approach, which can touch the psychological side of humans about nature and its environment.

The purpose of this study is to present an analysis of ecological content on reading materials and instructions on Skillful Reading and Writing book written by Bohlke (2012) – a compulsory student book in the Critical Reading and Writing I course in English Language Education Study Program of Musi Charitas Catholic University. Reading materials and instructions are on the analysis from the aspects of 1) appreciation of nature, 2) realistic ecological problems, 3) positive tone, 4) appropriate illustrations, and 5) hope for a solution. The results of this research were expected to be able to provide benefits in increasing awareness of the importance of ecological content in teaching materials in universities for both lecturers and students and developing ecological-based teaching materials and instructions that can be a reference for all parties.

Method

This study belongs to qualitative descriptive research with document study data collection techniques. This type of research utilizes qualitative data and is described descriptively. According to Sugiyono (2018), this method is carried out to observe independent variables without making comparisons or drawing relationships with other variables. Meanwhile, Arikunto (2019) emphasizes research with this method intended to investigate certain matters and the results are presented as a research report.

The qualitative descriptive method was carried out by recording obtained from sources or written data. The data source in question was a textbook entitled Skilful Reading and Writing, which is used as a compulsory book in the Critical Reading and Writing I Course at English Education Study Program, Musi Charitas Catholic University. The type of data in this study was the text or teaching material documents contained in the book. In the textbook, the targets for analysis were the readings and the instructions on the questions and the exercises

The research data were collected by the rubric developed by Rule and Atkinson (1994). Meanwhile, the ratings assigned based on the following scale (5) Outstanding: exceeds every part of the criteria with not one question in mind, (4) Very Good: meets criteria with slight omissions, (3) Good: covers the topic of the criteria but could do more, (2) Fair: may discuss one part or at least has some science-related material, (1) Not Recommended: has no mention of the criteria at all.

Findings and Discussion

At the primary stage of collecting data on reading materials in Bohlke's book, 20 readings were obtained and distributed in 10 lecture topic chapters. Each reading is equipped with a reading title and pictures. Not all readings were presented in paragraph formats but some were in survey formats which directly involve readers' responses not only in comprehension but also in reading activities.

All readings were taken into the analysis on each criterion namely appreciation of nature, realistic ecological problems, positive tone, appropriate illustrations, and hope for a solution.

Table 1. Ecological aspects and criteria

No	Scaling Categories	Criteria
1	Nature Appreciation	Assesses the degree to which the book depicts beauty and harmony in nature. Answers the question, "What is the beauty of nature?"
2	Realistic Ecology Problem	Presents an ecology problem in a realistic manner, without oversimplification or exaggeration. The effect of human choice on the situation is clear. Answers the questions, "What is it? How does it work?"
3	Positive Tone	Emphasizes being effective in solving the problem rather than assigning blame or being "right." Positive and appropriate behaviours are emphasized, and the tone does not induce fear.
4	appropriate illustrations	Assesses the degree to which illustrations enhance the text. Answers the questions, "Do illustrations complement and enhance the text? Are illustrations and photographs appealing? Do illustrations move the story forward?"
5	hope for a solution	Assesses to what degree books convey a feeling of hope for a viable solution to the problem. Answers the question, "Is there hope for a solution?"

From all the readings, the average results of the analysis of those 5 aspects of each reading in the book were obtained (see figure 1). The average value of the positive tone aspect was 4.9. Then that was followed by realistic ecological problems with a score of 4.15. The value of 4.05 is for the average appreciation of nature. The second lowest score is on the aspect of appropriate illustrations. While the lowest score on the hope for solution criterion is a score of 2 for each reading.

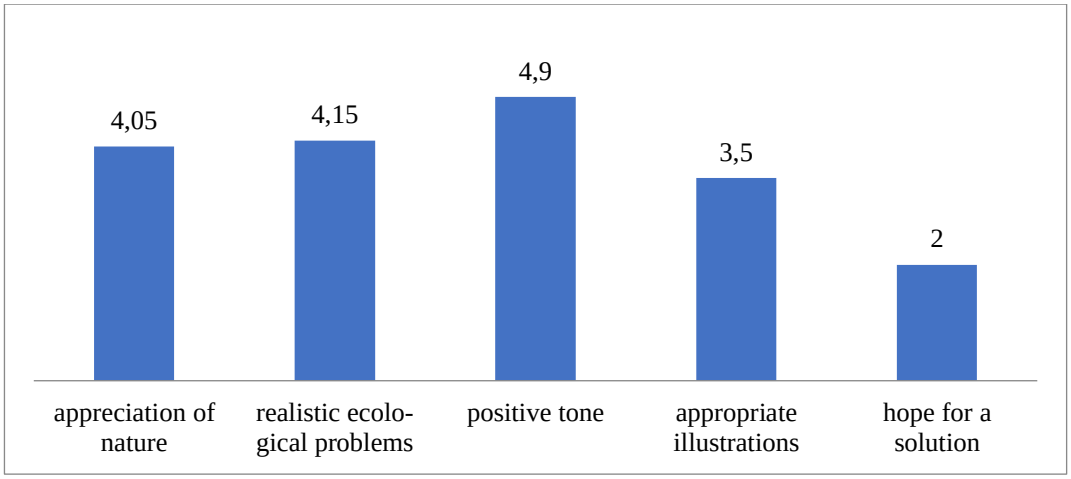

Figure 1. Average analysis scores of 20 readings

Table 2 presents all assessment data from each reading based on each criterion. Of all the readings, 9 readings had a score of 5 (the highest) on the appreciation of nature and realistic ecological problems criteria. Judging from the positive tones criteria, 19 reading passages got a score of 5. On the appropriate illustrations criterion, 6 readings had a score of 5. Meanwhile, for the hope for a solution criterion, the overall score for each reading was 2, which means that the reading might discuss one part or at least has some science-related material.

Table 2. Analysis Results

Title\Ranking	appreciation of nature	realistic ecological problems	positive tone	appropriate illustrations	hope for a solution
Are you a natural leader?	3.0	4.0	5.0	3.0	2.0
The hero within	3.0	4.0	5.0	3.0	2.0
A matter of time	2.0	2.0	5.0	3.0	2.0
What time is it?	2.0	2.0	5.0	3.0	2.0
Home is where the heart is	4.0	4.0	5.0	3.0	2.0
Home automation	5.0	5.0	3.0	2.0	2.0
Fuel of the sea	5.0	5.0	5.0	5.0	2.0
Size doesn't matter	5.0	5.0	5.0	5.0	2.0
Time for a change	5.0	5.0	5.0	5.0	2.0
The Fibonacci sequence	5.0	5.0	5.0	5.0	2.0
Hurry up and slow down!	5.0	5.0	5.0	2.0	2.0
Keeping up with the Tarahumara	4.0	4.0	5.0	3.0	2.0
Is seeing really believing?	4.0	4.0	5.0	3.0	2.0
Color and flags	2.0	2.0	5.0	3.0	2.0
Earth's final frontier	5.0	5.0	5.0	5.0	2.0
Super Sherpa	5.0	5.0	5.0	5.0	2.0
Coming of age	4.0	4.0	5.0	3.0	2.0
Gardening 380 kilometers above earth	5.0	5.0	5.0	2.0	2.0
The farmer's lazy son	4.0	4.0	5.0	4.0	2.0
Leave it for the robot	4.0	4.0	5.0	3.0	2.0

From each reading, the average of all measurement results was also calculated (see figure 2). There were 6 reading passages with the highest average score, 4.4. The titles of the 6 readings were *Fuel of the sea*, *Size doesn't matter*, *Time for a*

change, *The Fibonacci sequence*, *Earth's final frontier*, and *Super Sherpa* respectively.

Furthermore, there were 3 readings with an average value of 3.8. The reading titles were *Hurry up and slow down! Gardening 380 kilometres above the earth*, and *The farmer's lazy son*. The other 5 reading passages getting a score of 3.6 was *Home is where the heart is, Keeping up with the Tarahumara, Is seeing believing?, Coming of age*, and *Leave it for the robot*.

The other 3 readings had an average score of 3.4. The three readings were each entitled *Are you a natural leader? The hero within*, and *Home automation*. While the passages with the lowest average score with a score below 3 were *A matter of time, What time is it?*, and *Color and flags*.

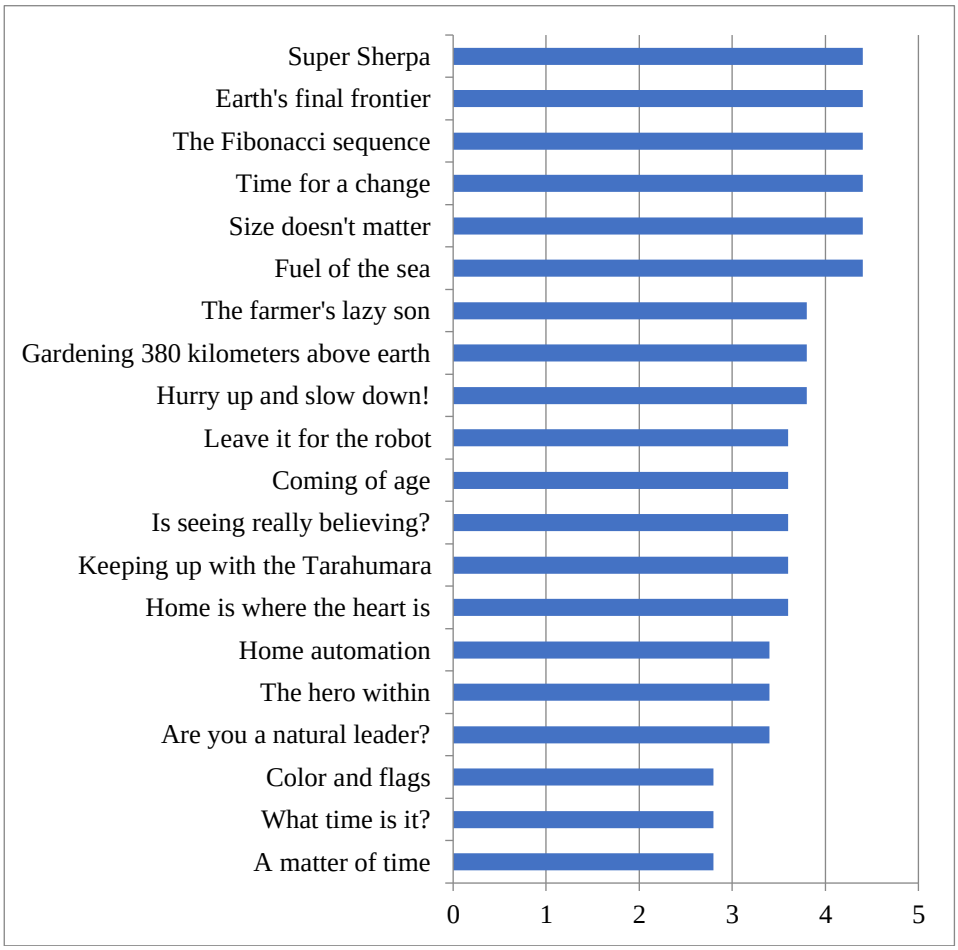

Figure 2. External problems faced by the students

One of the titles with high marks next was *Fuel of the Sea* (Picture 1). This reading presents how a small living creature called krill can maintain the ecosystem in the sea. Its function as a living creature can be of benefit to its surroundings. It also wants to present the world of the sea to students. The understanding gained should be able to invite them to respect the environment and keep the sea clean for the sake of preserving the ecosystem and the sustainability of living things in the sea. In short, the tone used is positive enough to increase ecological value.

As an effort to appreciate nature, the reading also provides an indirect description of the role of a small creature in the sea, which sometimes has no economic value, is included in the food chain and plays an important role as an ecosystem. Realistic ecological problems are raised through a description of the effects of extinction that could occur if these animals do not exist or become extinct. The images used are quite representative, not only to make the reading look attractive but also to help students get to know nature more closely.

Hunaepi et al., (2016) conducted validity tests on textbooks to check their suitability and impact on ecology. The results of the validity tests were in the score range > 3.6 with a reliability percentage value for each assessment component above 75% indicating a valid value. They – the researchers - clarified that one of the validity factors of the books was the feasibility and ability to develop students' scientific attitudes. The result also provides an opportunity for some of the ecological readings in this skilful reading and writing book to be able to concretely rectify the scientific attitudes of the students.

Picture 1. The passage entitled *Fuel of the Sea*

One of the reading titles with the second highest average score is Gardening 380 kilometres. This reading raises a big plan from the world of science to grow plants in outer space. It is not an easy thing to do this as described in the contents of the reading. But from the reading, it is very clear that it provides an illustration of a greener future world where plants that produce oxygen will be more numerous and sustainable.

From these readings, students got a picture of a better world positively in relation to the environment. Appreciation of nature was presented through tree planting. Meanwhile, realistic ecological problems were presented through concerns about technological developments that should be accompanied by more

ecological alternatives. The reading content that reviewed the design of nature conservation through empowering technology provides a positive tone for students to learn more about nature conservation. The pictures used were also quite helpful for students to be aware of the environment. Leaves (plants) and pictures of astronauts were suitable representations to present popular readings.

Regarding the learning instructions, Bohlke did not convey what students could do to pay much attention to their environments. This could be supplemented, according to Jones and Galloway (2013) in their article on the curriculum design through Ecological Lens, by certain adjustments so ecological goals could be obtained. In their study, they adjusted the curriculum from social to ecological orientation and organization. A similar thing could also be carried out by adjustments or changes in the field of learning materials, such as readings so that the expected ecological goals could be met (Hungerford, 1980).

Picture 2. The passage entitled *Gardening 380 Kilometers above Earth*

One reading that has the lowest indicator value is *What time is it*? This reading explains the history of clocks that can be used to measure time. In essence, the history of clocks to determine the time is explained chronologically to provide knowledge about how clocks were invented and have no direct connection with the human environment.

Picture 3. The passage entitled *What Time is It?*

The lack of learning instructions that lead to ecological understanding and behaviour makes it seem as if the reading content has no direct relation to the environment. Nevertheless, the development of clocks at the beginning was very dependent on and from nature, namely the sun or sundial and so did the sand or sand watch.

Taking this matter to be actual to relate it to ecology is not impossible. For this reason, the contents of the reading still provide a good notion of the natural environment and appreciation of nature.

Conclusion

Bohlke's Skilful Reading and Writing book were aimed at teaching materials related to reading and writing skills. Books are so well designed through meaningful and efficient sequences of activities or learning instructions that students might not get difficulties understanding the structure of the book. This book openly had no specific concerns for the world of ecology in general or the environment in particular. This was reinforced by the absence of information in the introduction or in any part of the book that gives an intention to the field of ecology.

From the description of the results and discussion, it concluded that reading in critical reading and writing books provides an alternative for getting to know the ecology and instilling ecological values in everyday life. This was supported by the overall average score of each reading, 3.72 or almost 4; it met the criteria with slight omissions. However, not all those selected readings were supplemented with learning instructions leading to real actions to preserve and appreciate environments. Therefore, teachers were supposed to make purposively instructional adjustments to students' conservation practices.

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