

Development of Wetland Environment Based Textbooks to Improve Critical Literacy Competencies



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ABSTRACT: Based on rankings carried out by a number of international institutions, the literacy level of Indonesian students is still below the literacy level of other countries. Based on the research results, there are a number of factors that cause this. One of these factors is the need to provide quality textbooks for critical literacy learning. However, until now there have been no good textbooks designed to improve critical literacy competencies. Therefore, research into the development of this textbook was carried out. The development of this book is based on the land environment and critical literacy. In the development process the ASSURE model was used (*analyze learners; state objectives; select (methods, media, and materials); utilize materials; require learners' participation; evaluate and revise*). The results of the development obtained the following findings: the validation results from material and language experts obtained an average score of 89%, which means it is very feasible; the results of media expert validation obtained an average score 92% which also means very feasible; and students' literacy competence before using this book was 59.64 and after using this textbook their competence became 79.47, which means there was an increase in literacy competence by 24.95%. The implication is that the textbooks resulting from this development need to be used in language learning in schools to improve students' critical literacy competencies.

KEYWORDS: Textbooks, Wetland Environment, Competence, Critical Literacy

INTRODUCTION

We are now in the era of industrial revolution 4.0 which is marked by various trends, including technological discoveries that blur the boundaries of the physical, digital, and biological fields. In addition, in this era, technological breakthroughs emerged in a number of fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, Industrial Internet of Things (IIoT), fifth-generation wireless technology, additive manufacturing, and the fully autonomous vehicle industry (Savitri, 2019).

On the one hand, various discoveries in the field of technology open up opportunities for the superior generation to use them as a means of building benefits for their lives. However, on the other hand, these various findings will also have an impact on a number of forms of disruption in various aspects of life so that it may cause various surprises and frustrations for generations who are not ready to face it.

From the aspect of information technology, the industrial era 4.0 provides convenience in terms of speed and breadth of information access. The abundant data available in the virtual world also makes access to information easier. For the superior generation, this is a gift that can be used for the benefit of life by building and designing information networks. However, getting lost due to the use of information will also be a common symptom affecting a generation that is unable to sort and select information accurately (Davidowitz, 2019; Nichols, 2018).

Whatever the impact, whether positive or negative, the Industrial Era 4.0 will ultimately not only change what we do but change who we are. What competencies must be possessed in order to survive the challenges and waves of disruption that will occur? The perspective that life flows because it eventually reaches a destination does not seem very relevant to answering future life. Creativity, innovation, and adaptability seem to be various qualities that must be possessed which will always be reflected in future steps in life.

If that is the situation, what should the world of education do to prepare a superior generation so that they can be creative, innovative, and adaptive in living life in the industrial era 4.0. Of course, there are many things that need to be done, one of which is providing critical literacy competencies to students in schools. This competency is a basic competency that will build and strengthen a number of other competencies.

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At first, literacy was considered only a matter of language competence. However, in current developments, literacy is a concept that is more than just linguistic, so that literacy is a social and political action to make someone a person (Barton & Hamilton, 2000; Baynham, 1995; Freire, 2008; Gee 1996, 2000; Street, 1995). Even, UNESCO firmly states that literacy is an important means for effective economic and social participation. In fact, literacy contributes to developing humanity and reducing poverty. Literacy can encourage and maintain social togetherness and contribute to the fair implementation of human rights.

The description above indicates how important it is to form critical literacy in students. Now the question is what is the critical literacy level of students in Indonesia? It turned out to be a result of being conducted by international institutions and research results show that the critical literacy competence of Indonesian students is still very low. PISA (*Program for International Students Assessment*) conducting literacy competency rankings of school students every three years. The aim is to show the literacy level of students aged 15 years in a country. There are three literacies that they measure, namely critical literacy, mathematics, and science. Student literacy competency in a country is considered good if they have an average score of 500.

Since participating for the first time in 2000 until now, the average literacy score of students in Indonesia is still low compared to the competency of students in other countries. Until 2018, it turned out that Indonesia's literacy level score based on the PISA ranking had not moved from previous years, in fact, it had decreased from the 2015 PISA results (Dewabrata, 2019). The results of research in schools also show the same symptoms as the ranking results above. The research results of Jumadi et al. (2018) show the average competency score of junior high school students in Regency Barito Kuala was 52.18 (low); Meanwhile, research by Jumadi et al (2020) shows that the average competency of junior high school students in Banjarmasin is 57.23 (also classified as low).

From the results of the research, it was revealed that the low level of critical literacy competency in the two schools was caused by: (a) critical literacy learning materials still focused on understanding the structure and content of texts. The material taught has not been directed towards a critical study of the text and the implications of the text's contents for the needs of social, national and state life; (b) the learning process has indeed led to active student learning, but because it is focused on understanding the structure and characteristics of the text, the question and answer process carried out has not yet led to higher level thinking; (c) critical literacy learning is not specifically taught; (d) there are no textbooks that are used specifically to improve critical literacy competencies; (e) the material is inserted into relevant learning materials; (f) there are no special training and critical literacy competitions as a means of cultivating students' literacy competencies; and (g) the evaluation in question has not yet led to the exploration of higher level thinking as part of the ownership of critical literacy competencies.

From the findings above, it appears that critical literacy learning in schools has not been designed with adequate textbooks. Even if there are, the textbooks used by teachers are not prepared based on the student's learning environment. The reading in the book is not contextual so the reading feels foreign to the students' environment. With the readings in the book, students are not familiarized with their environment so they are not invited to understand, analyze, and think about the environment.

Based on the facts above, development research was carried out to produce critical literacy textbooks that are suitable for junior high school students. From this development, it is hoped that a textbook will be produced that can be used by teachers to improve students' critical literacy competencies.

METHOD

Types and Development Models

This research includes development research. The main aim of this research is to produce critical textbook products based on wet environments for junior high school students. The development model used is an adaptation of the ASSURE model (analyze learners; state objectives; select (methods, media, and materials); utilize materials; require learners participation; evaluate and revise) proposed by Smaldino (2005).

To produce textbook products based on land environments, there are several stages of activity. These stages are an elaboration of the Development Model that has been established. The first stage is to carry out an initial test of students' critical abilities. The next stage is to analyze the 2016 Indonesian language curriculum used in schools. The purpose of this analysis is to describe Competency Standards and Basic Competencies related to critical learning at the unit level in junior high school. This stage is continued with the design stage of textbook product development. The next stage is conducting expert tests and field tests.

Product Trial

1. Trial Design

Expert test for validating critical material compiled in textbooks. Critical literacy expert who validates at least a doctorate degree. The results of this validation are used to revise the products that have been produced before field testing. After revisions are carried out, the next stage is a field test. This activity is carried out in schools by conducting learning using syllabi and textbooks that have been validated by critical experts. From this field test activity, it can be seen the effectiveness of products that have been produced. Before being printed finally, the textbook is revised according to the results of field trials. The result is a textbook product that is ready to be printed and used in schools.

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2. Test Subjects

The test subjects for this research were one critical learning expert and one expert for validating book designs with at least a doctoral degree. This expert will validate the syllabus and textbooks that have been developed. In addition, the subjects of this research were class VII Indonesian language students and teachers in three schools in Banjarmasin. The school chosen was a school whose students lived around the riverbanks in Banjarmasin City.

3. Data Type

This research data consists of quantitative data and qualitative data. Quantitative data comes from questionnaires given to critical learning experts to validate textbooks. Apart from that, quantitative data comes from the results of critical literacy tests of students who have received learning materials using developed textbooks. Meanwhile, qualitative data is data from interviews with students and teachers.

4. Data Collection Instrument

There are some instruments used in this research, namely observation guidelines, interview guidelines, questionnaires, and tests. The use of each instrument can be seen in Table 1 below.

Table 1 Data Collection Instruments

Number	Data	Instrument	Information
1.	Implementation of critical learning in schools.	Observation guidelines, interview guidelines.	<ul style="list-style-type: none"> • The observation guide contains a checklist of activities carried out by teachers and students in critical learning. • The interview guide contains questions that will be asked to teachers and students regarding critical learning using wetland-based non-teaching. • The questionnaire contains questions about the wetland-based critical learning model.
3.	Feasibility of a wetland-based critical learning lesson plan model.	Questionnaire	<ul style="list-style-type: none"> • Expert and practitioner respondents (teachers) provide assessments by ticking on a scale of 1 to 5. • Respondents provide qualitative assessments in the comments column. • The questionnaire contains questions about the wetland-based critical learning textbook model.
4.	Feasibility of a wetland-based critical learning textbook model.	Questionnaire	<ul style="list-style-type: none"> • Expert and practitioner respondents (teachers) provide assessments by ticking on a scale of 1 to 5. • Respondents provide qualitative assessments in the comments column. • Description test to measure students' critical abilities regarding a number of readings in critical textbooks.
5.	Student ability level.		

5. Data analysis technique

Data analysis of students' critical abilities in experimental and group student groups was carried out with statistical analysis by carrying out the t-test. Data analysis was carried out using the SPSS 20 for Windows program. The experimental design used is as follows

Pretest	Posttest	Treatment
01	X	02

Meanwhile, the criteria for the level of validity of the questionnaire filled out by critical learning experts use a formula percentage level of validity as follows.

Table 2: Level Criteria Product Validity

Range Score	Eligibility Level
85% - 100%	Very worthy (no need for revision)
75% - 84%	Decent (needs revision)
65%-74%	Decent enough (needs revision)
55% - 65%	Not suitable (needs revision)
0% - 54%	Not suitable (needs revision)

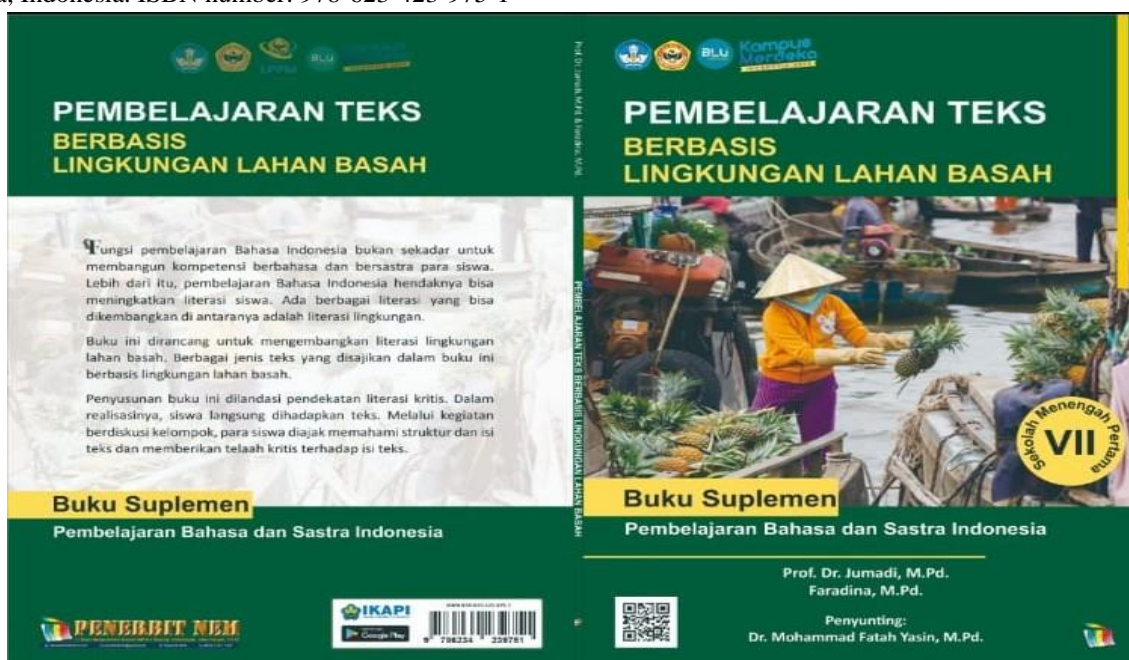
RESULTS

Research result

1. Description of Development Results

The image below is the cover of the resulting textbook. This textbook contains six lessons with each lesson based on a text with the following theme: (a) Lesson 1: The Need to Keep Rivers Clean; (b) Lesson 2: The Need to Address River Pollution; (c) Lesson 3: The Need to Understand the Cultural Heritage of Water; (d) Lesson 4: Necessity Conserve Richness of Flora and Fauna of the River Environment; and (e) Lesson 5: The Need to Prevent Mangrove Forest Destruction; and (f) Lesson 6: The Need to Prevent Peatland Fires.

This book has now been published by the publisher NEM which is located at Jalan Raya Wangandowo, Bojong, Pekalongan, Central Java, Indonesia. ISBN number: 978-623-423-975-1



2. Material and Language Expert Validation Results

The validity of the material presented in this textbook and its level of communicativeness have been tested by critical literacy material experts. The results of validation from material and language experts obtained data as shown in the following table.

Table 3: Material and Language Expert Validation Results

No.	Aspect	Score	Category
1.	Content Eligibility	92%	very worthy
2.	Feasibility of Presentation	88%	very worthy
3.	Language Eligibility	88%	very worthy
4.	Contextual	88%	very worthy
	Average	89%	very worthy

From Table 3, it appears that the average score for the appropriateness level of the material reached 89%, which is very feasible, so it can be concluded that according to expert validation, the material and language of this book is very suitable for use.

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3. Media Expert Validation Results

Apart from the material's level of communicativeness, the design of this book was also validated by media experts. The media expert validation results are presented in the following table.

Table 4: Media Expert Validation Results

No.	Aspect	Score	Validation Score
1.	Feasibility of model sizes	100%	very worthy
2.	Feasibility of cover design	86%	very worthy
3.	Feasibility of Content Design	90%	very worthy
4.			
	Average	92%	very worthy

From Table 4 it appears that the average feasibility level according to media experts is 92%, which means it is very feasible. Thus, in terms of design, this book is very suitable for use.

4. Student learning outcomes

To prove whether the use of this book can improve students' critical literacy competencies, a trial was conducted at school with a large group. There were 83 students used for three schools. The test results can be seen in the following table.

Table 5: Statistical test results comparing initial and final test scores

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Initial Test Scores	59.64	83	4,800	,527
Final Test Score	79.47	83	2,965	,325

Based on the table above, it can be seen that the average value for the initial test score is 59.64 and the average value for the final test score is 79.47 for respondents of 83 students. There was an increase in the average score of 19.83 or 24.95% from the initial test score to the final test score. An increase in the average score of the final test results shows that there is an impact or change in the level of competency obtained by students after using books in the learning process.

DISCUSSION

This book was prepared using a contextual learning approach. Johnson (2002) states that contextual learning is a system that stimulates the brain to construct patterns that create meaning. Contextual learning is a brain-friendly teaching system that produces meaning by connecting academic content with the context of students' daily lives.

Through this contextual approach, the material presented in this book contains various wetland environmental texts. The six lessons as mentioned above are all related to the environment. Why is the wetland environment a learning topic? This is according to the users of this textbook, namely students in the city of Banjarmasin, a city surrounded by rivers so this city is given the nickname "City of a Thousand Rivers."

With topics that are familiar to students' environment, they finally recognize the results of things that happen in the environment, for example, the level of river pollution, various community behaviors that cause river pollution; damage to mangrove forests in the area due to human behavior; how to conserve flora and fauna in the environment; How to prevent peatland fires. By providing material that is close to their environment, students ultimately understand the characteristics of their environment well and realize their responsibility to preserve it. These results are shown when they read the text, discuss its contents, and answer questions related to the contents of the text. Before learning using this developed book, their understanding of these things was very low. This is shown by the very low score when the pretest was carried out with an average score of 59.69. However, after learning using this book, their post-test results were much better with an average score of 79.67.

The preparation of this book also uses a critical literacy approach. Critical literacy theory views literacy as an act of understanding that empowers a person by helping them find their voice and ethical responsibility to improve their world. In other words, literacy is the ability to empower criticism and analysis with ways of knowing and ways of thinking about and assessing knowledge, constructed in and through written texts (Hammond & Macken-Horarik in Abednia, 2015).

Through a critical literacy approach, learning is directed so that students can solve problems faced in the environment. Problem-solving is carried out through group discussions and test work, both in groups and individually. Below are examples of their

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answers when answering questions individually. At the end of each lesson, students are assigned individually to answer a description test.

The tests that students have to take contain questions whose answers are in the text and some that come from outside the text that they have to infer. From the existing answers, it seems that students can critically answer questions. Their critical competence has increased greatly, which indicates that students understand the content of the text and can provide appropriate answers when they have to provide solutions or suggestions for overcoming problems in the text.

The ability to think critically to provide solutions to problems in the texts he reads becomes the focus of development. This is based on the critical pedagogical perspective presented (Freire, 1972) which states that education is not only the transfer of knowledge but the meeting of subjects in dialogue in the search for the benefits of the object of the process of knowing and thinking. Through the dialogue process, the verbalization of the language used in interactions between students and teachers in the context of implementing critical pedagogy takes place well.

The learning model chosen in this book's learning scenario follows the syntax presented by McLaughlin and Allen (2000). In this model, learning is carried out through 5 procedures, namely explanation, demonstration, guidance, practice, and reflection. Through these steps, students are invited to read the text, discuss the content of the text, provide critical analysis and solutions to problems in the text, present the results of their discussions, take tests independently, and reflect on the learning process that has been undertaken.

CONCLUSIONS

Literacy learning in schools using the books developed is not only aimed at providing competency knowledge about text structure and text meaning, but beyond that, it is able to build student competency to be able to respond to texts and use them to answer environmental problems critically. Therefore, critical literacy learning is carried out in three domains, namely the cognitive domain, affective domain, and psychomotor domain.

Based on the validation results of material and language experts, media experts, and the results of students' critical literacy competency tests, this book is very suitable for use in junior high schools for learning Indonesian. Therefore, this book needs to be disseminated and used in schools. With this book, it is hoped that teachers can improve students' literacy competencies, which are still very low.

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