



Developing Project-Based Learning-Based eBook “Critical and Creative Reading” to Improve Students' Critical Thinking Skills

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Abstract: This study aims to examine the feasibility and effectiveness of the development of electronic-book-based Critical and creative reading project to improve students' critical thinking skills. This study was developed based on the Research and Development (R&D) model by Brog and Gall. The stages conducted in this study were (1) needs analysis, (2) planning, (3) development, (4) product validity, (5) revision, (6) response test, (7) revision, and (8) final product development. The product validity was assessed by two experts in teaching materials and graphs as the validators. The result of the validity assessment was then processed using the five-scale formula. The revision was done to meet the validators' suggestions. Response test was conducted with students of the Indonesian Language Education Department of Universitas Ahmad Dahlan. The test results were processed using the AIKEN V formula. A revision was then made to meet students' suggestions obtained from the test. At last, a trial was carried out to measure the effectiveness of the product in order to become the guideline to develop the final product. The research findings were as follows: (1) the lecturers and students in learning critical and creative reading in higher education expected teaching materials that were easily accessible, electronic, and collaborated with one of the learning models so that they were able to measure the success rate of the critical and creative reading process; (2) product development was carried out through the activities of designing materials, models and evaluations that were developed in a product, as well as designing electronic books in accordance with the results of the needs analysis; (3) the appropriateness test results by the material experts obtained 3.40 in the good category and the layout expert scored 4.65 with a very good category. The results of the response test for students after being calculated with the Aiken V formula obtained a score of 0.85 – 1.00 with a very good category. The results of the experimental test showed that the posttests of the control and experimental classes obtained results of 0.001, which showed <0.05 , so H_0 was rejected. Students' critical thinking skills after the treatment were significantly different. Therefore, the teaching material developed was effectively used to improve students' critical thinking skills.

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Introduction

Reading literacy is a problem that must be solved in the world of education in Indonesia. Reading literacy is very important, because currently the ability of students, especially students in solving a conceptual problem, is closely related to reading literacy (Adi & Habsari, 2021); (Nanda Pratiwiningtyas et al., 2017); (Gogahu & Prasetyo, 2020). Patiung

(2016) stated that reading literacy is more focused on the ability to understand information. This ability refers to several activities, namely gathering information, processing information, and communicating information which in the scope of schools and universities are combined through reading learning (Adi & Habsari, 2021).

Reading literacy is a problem that must be solved in the world of education in Indonesia. Reading literacy is very important because currently, the ability of students, especially students to solve a conceptual problem is closely related to reading literacy (Suwartini, 2016). The importance of learning to read in a student environment is conveyed by (Clifton, 2022) who states that learning to read is very important for students to master. Through reading learning, students can practice sharpening thinking skills, this arises from several things that enter a series of reading activities (Rahayu & Nurbaya, 2022).

Faar (through Solihatun, 2019) argues that '...reading is the heart of education', reading activities are very important activities to be familiarized with, because reading activities are the heart of education. Reading can also be a measuring tool for someone in terms of critical thinking (Dafit and Mustika 2021). Several indicators of the importance of reading learning for students above are currently not well-achieved (Alsmadi et al. 2023).

It is evidenced by the 2018 PISA results report released on December 3, 2019, which states that Indonesia's reading score is ranked 74 out of 79 countries. The score decreased from the PISA test conducted by Indonesian students in 2015. At that time, the reading score of Indonesian students was ranked 65th (Setiawan., et al 2017). In 2022, the results of the PISA study, Indonesia experienced an increase in rank. namely 5-6 ranks from 2018. It was the highest achievement in rank throughout Indonesia's history of participating in PISA (Febrianti et al. 2023). The increase in Indonesian students' PISA scores needs to be maintained through conscious reading behavior (Ramadhanti 2019); (Wirawati 2017); (Suwartini and Fujiastuti 2017); (Nisa, Enawar, and Latifah 2022).

Reading awareness must be fostered (Adi and Habsari 2021) especially among students of the Indonesian Language Education Study Program, who are prospective Indonesian language teachers and of course, will be the pioneers of the literacy movement for students in schools (Ramandanu 2019). On the other hand, based on the revision of the cognitive domain used as a guideline in conducting learning. Bloom's taxonomy states that the high-level thinking level consists of; (1) analyzing; (2) evaluating and; (3) creating (Momang 2021). Reading learning for students as the highest level of education, must achieve this. Reading learning for students, which is closely related to critical and creative thinking, is implemented in critical and creative reading courses (Aryanti Agustina 2021).

Critical and creative reading courses are reading family courses for Indonesian Language and Literature Education (PBSI) students (Wirawati, 2021). This course aims to invite students to practice critical thinking through the stages of identifying, analyzing, and evaluating reading texts; through these various processes, students are expected to be able to identify information, content and problems that occur in each text to evaluate the text so that students are able to distinguish various types of texts according to their elements, structure, content and language rules. The critical thinking process is closely related to creative thinking.

This course aims to invite students to practice critical thinking through the stages of identifying, analyzing, and evaluating reading texts; through these various processes, students are expected to be able to identify information, content and problems that occur in each text to evaluate texts so that students can distinguish various types of texts according to their elements, structure, content, and language rules. The critical thinking process is closely related to creative thinking. Creative thinking is a person's ability to generate an idea in a

specific context by looking at a situation (Sosu, 2013). Creative thinking in reading learning is often studied in creative reading courses.

In line with this, Rahayu & Nurbaya (2022) state that creative reading is a reading process that does not stop until the reading process is complete, creative reading has a follow-up, the follow-up is in the form of producing activities, presenting in writing, assembling, compiling, and making a product that begins with an understanding of the ideas expressed by the author through reading material. The creative thinking process is seen when readers apply reading ideas in presenting the reading into text reproduction activities (Adi and Habsari 2021).

Currently, reading learning, especially critical and creative reading in higher education, has not been able to be implemented properly (Suwartini and Fujiastuti 2017). This phenomenon is due to several things, especially the use of textbooks (Ardiasri, Priyatni, and Andajani 2017). Textbooks are a component of learning, which will certainly support the success of the learning process (Cahyadi 2019). Teaching materials in reading courses, especially critical reading, are currently widely circulated, and are easily accessible to students for learning. However, no textbook is actually compiled and used as the main reference for critical reading courses. In fact, teaching materials greatly determine the success of students in achieving course achievement indicators, namely being able to apply the process and produce outcomes critically (Suwartini 2016).

On the other hand, the collaboration between teaching materials and technology can be applied through the development of E-books in learning (Gusman, Apriliya, and Mulyadiprana 2021); (Wahyuni and Rahayu 2021); (Khairinal, Suratno, and Aftiani 2021). Digital teaching materials or electronic books are teaching materials that are presented digitally. Sari (2021) states that the characteristics of digital teaching materials are as follows; (1) presented digitally, and can be accessed using a device, laptop, or PC; (2) as a source of learning material; (3) make learning more flexible; (4) easily accessible.

In addition to teaching materials, learning models that should be able to help students achieve the main objectives of the course are still very much needed. The learning model is a plan or pattern that can be used to form lesson plans, design learning materials, and help lecturers and students in the process of achieving the courses taught (Mirdad 2020). In learning critical reading, the use of teaching materials and learning models is an alternative solution, which can be used to solve the problems of student reading learning (Rahman, 2021).

Learning models can be collaborated into teaching materials, it will facilitate the process of achieving learning objectives (Ismail, Rifma, and Fitria 2021). One of the learning models that can be developed and collaborated into critical reading teaching materials is a project-based learning model. The project-based learning model is one of the learning models that requires learning outcomes in the form of projects (Jamilah 2017). The project-based learning model is currently being discussed.

The steps of project-based learning are as follows: (1) presentation of the problem; at this stage, the problem posed is an essential problem. The essential question aims to motivate students' enthusiasm in learning; (2) planning, planning is done by designing a competency standard that will be carried out; (3) preparing an activity schedule, preparing an activity schedule can be done through an agreement between students and lecturers; (4) monitoring project making, lecturers can carry out this activity to monitor projects carried out by students; (5) conducting assessments, assessments need to be carried out authentically, in this activity lecturers can make variations related to the evaluation process carried out, for example asking other students to conduct team assessments; (6) evaluation. Evaluation is

carried out to reflect on the learning that has been done (Sumarni, Wijayati, and Supanti 2019); (Kosasih 2017); (Agustina, Kusmiyati, and ... 2022); (Bell 2010); (Yulianto et al. 2017).

In the realm of students, this model is being promoted through the Merdeka Belajar Kampus Merdeka program, which is compiled into the MBKM curriculum (Khotimah et al. 2021). The application of the project-based learning model to students will familiarize students to focus on following the MBKM curriculum. On the other hand, the implementation of project-based learning in teaching materials for critical reading courses will make it easier for students to achieve the main objectives of critical reading learning (Krishnapatria 2021); (Febrianto, Maureen, and Bachri 2023); (Sintiawati et al. 2022).

Overall, research on the development of reading textbooks, as well as the implementation of project-based learning models in textbooks has been carried out (Rizqi Aji Pratama 2016); (Dafit and Mustika 2021); (Yuliana and Atmojo 2021); (Ardiasri, Priyatni, and Andajani 2017); (Aryanti Agustina 2021); (Wahyuni and Rahayu 2021); (Jamilah 2017); (Martin 2020); (Himawan and Suyata 2021); (Arifin and Retnawati 2017). The research is said to be in line with the research conducted because it makes many contributions. Contributions can be seen that these studies contribute to the form of how to develop coursebooks, theories used in developing teaching materials, theories of critical and creative reading learning, to several theories about PjBL as a basis for researching the development of project-based learning-based critical and creative reading coursebooks to improve students' critical thinking skills. This research can be said to be a continuation of some of the research indicators above, trying to complete the shortcomings described by the research reviewers in the research article as a form of research novelty, so that research related to the development of teaching materials, especially in reading learning in higher education, is more complete, and can be used as a foothold in conducting relevant further research. The novelty of this research lies in the theory of critical and creative reading in higher education which has not been widely studied, the link between MBKM and project-based learning which is combined and raised through critical reading teaching materials to improve critical thinking skills which at this time these skills are needed (Leniati and Indarini 2021); (Hidayat and Nur 2018). This research aims to develop critical and creative reading textbooks based on project-based learning to improve students' critical thinking skills.

Research Method

This research method used Research and Development (R&D). This research and development is implemented to create a product and can measure its effectiveness (Sugiyono, 2016). This research refers to the model (Brog & Gall 2003). There are two main objectives, which are the procedures in developing this model. These objectives are (1) developing a product and (2) knowing the response and effectiveness related to the product developed (Sutriyati, Mulawarman, and Hudiyo 2019). Furthermore, the stages of development in this study were modified as needed. The modification of these steps in this study includes (1) information gathering, (2) product planning and development, (3) expert testing, (4) first-stage revision, (5) response and effectiveness testing, (6) second-stage revision (7) final product.

The data in this study were quantitative data and qualitative data. The quantitative data of this research was in the form of scores given by material experts, teaching experts and users to assess the feasibility of the products developed. Qualitative data in this study, in the form of data from observations in preliminary studies, as well as data related to suggestions given by material experts, media experts and users when assessing product feasibility. Data

collection techniques in this study were carried out by interview and questionnaire. Interviews were conducted with 7 lecturers at 7 universities and 10 students at PBSI UAD. The data collection instruments in this study were interview guidelines and questionnaires.

Descriptive data analysis, used to analyze data in the form of observation and interview results, related to the needs assessment study conducted in 7 universities within the scope of the Indonesian Language and Literature Education Study Program, which teaches critical and creative reading courses. Quantitative data analysis was used to describe the results of determining the quality of the products developed, including material and graphic expert tests by experts from UNY and student response tests at PBSI UAD using the five-scale formula and AIKEN V. Quantitative data analysis: next is testing the effectiveness of the product which was carried out in 2 reading classes of the Indonesian Language and Literature Education Study Program, FKIP, UAD. The experimental test in this study used a pre-test, post-test, and control group design (Ruseffendi, 2005).

Results and Discussion

1) Initial Description of Project-Based Learning-Based eBook ‘Critical and Creative Reading’ to Improve Students’ Critical Thinking Skills

Based on the results of observations, document analysis, interviews with lecturers in 6 universities and students in the Indonesian Language and Literature Education Study Program, FKIP, Ahmad Dahlan University regarding the initial description of the use of critical and creative reading teaching materials in universities, it can be seen that so far, no teaching materials have been found, especially, textbooks that can be used as the main reference for critical and creative reading lectures. Teaching materials that have been provided by lecturers to students in the form of (1) slides containing material made by lecturers; (2) students are asked to access scientific articles in journals relevant to lecture topics.

Document observation and interviews resulted in the finding that teaching materials for critical and creative reading are currently widely found. However, there are no teaching materials in the form of books or modules that are used as the main reference for lectures. In addition, many critical and creative reading teaching materials found today are only in printed form; there are not many critical and creative reading textbooks that can be used as the main reference for students in electronic form. These findings are reinforced by interview data with students as follows.

Tabel 1. The Results of Interviews with Students

No	Aspect	Answers
1.	Critical and creative reading learning conditions	a. Students are given material on identifying activities until presenting the text. b. Students still find it difficult to prove with the results of the “sudden” text presentation
2.	The real state of affairs, critical and creative reading learning today	a. Teaching materials used are still in the form of printed books “Tarigan” b. Slide from lecturer c. Articles from google d. Many students do not enjoy reading.
3.	Product specifications textbooks that need to be developed in mayta lecture critical and creative reading	a. Easily accessible b. Leads to critical and creative c. There is a learning model that directs students d. Technology-oriented, easy to learn anywhere, anytime.

The textbooks used as learning references still tend to use the book "Reading as a Language Skill by Henry Guntur Tarigan 2015". The textbook is collaborated with other teaching materials such as copies of material given by lecturers to students. Based on interviews conducted with students, these teaching materials tend to be boring because there is no element of novelty in the teaching materials provided. Some of these findings are reinforced by the results of interviews with lecturers as follows.

Tabel 2. The Results of Interviews to 6 Lecturers of Reading Subjects

No	Aspect	Answers
1.	Critical and creative reading learning planning in college	In critical and creative reading, students are able to interpret, analyze, organize, assess and produce a text
2.	The real state of affairs, critical and creative reading learning today	<ul style="list-style-type: none"> - Some students love to read because for them the knowledge obtained directly by the lecturer needs to be added as a refinement of the insights received. - For some students who are less fond of reading, the problem is that there is no free time to try to get knowledge, especially from reading materials, preferring to watch on digital platforms. - The critical attitude of students in learning to read is still lacking.
3.	The importance of developing critical and creative reading teaching materials.	- We strongly agree in the development of textbooks in reading courses, especially reading at a critical and creative level because it will have an impact on students to think critically and creatively through the stages of designing projects.
4.	Books that need to be developed in critical and creative reading courses in college.	<ul style="list-style-type: none"> - Present critical and creative reading techniques - Present reading material that is in accordance with conceptual problems - Collaborate with technology to provide understanding to students related to digital literacy.

The results of interviews with lecturers stated that lecturers require students to use the book as a reference in learning. Activities such as collaborating learning with learning models still tend not to be applied. The lecturer also admitted that he had never produced a reference in the form of a book which was collaborated with a learning model, such as a project. In fact, according to research (Wahyuni and Rahayu 2021); (Pangesti, Markhamah, and Rahmawati 2022) it is known that project-based learning greatly determines the success of a learning objective. Regarding assignments, students are usually given assignments only; the lecture material presented is limited to presentations using slides of material made by each student. In fact, when viewed from the final learning outcomes. Students are required to implement Output Based Education (OBE) based learning, which requires students to produce outcomes in every learning activity.

Based on some of these descriptions, lecturers and students really want the development of teaching materials, especially electronic books in learning critical and creative reading in universities, which collaborated with a learning model, such as project-based learning. Lecturers and students really want the main reference to support critical and creative reading lecture activities; students want teaching materials that can provide direction to carry out the process of critical and creative reading activities.

2) Development of Project-Based Learning-Based eBook 'Critical and Creative Reading' to Improve Students' Critical Thinking Skills

Based on the problems described above, it is very necessary to develop an electronic book for critical and creative reading courses in higher education, so that it can overcome

some of the problems that have been described. Overall, the development of these products is intended to provide references that are easily accessible and used by students in critical and creative reading activities. It is in line with research (Asnawi et al 2023), which states that electronic textbooks greatly facilitate students' learning and can hone students' critical thinking and creative thinking. The development of electronic books in this study consists of several stages, namely: (1) designing data, which contains material, and various evaluation questions derived from several theories; (2) designing users consisting of covers, and several electronic book supporting animations.

The selection of the project-based learning model is the basis for the approach to preparing the developed electronic book. Project-based learning in the developed product is used to facilitate students in completing projects such as reading argumentation, reading exposition text, reading description text, reading explanation text, reading narrative text, and reading news text. Overall, the project-based learning model used in the developed teaching materials, as an approach in the developed teaching materials, consists of; (1) designing reading activities; (2) developing reading activities; (3) scheduling reading activities; (4) presenting reading activities and (5) evaluating reading activities (Mardiana and Suyata 2017); (Kong, Cheung, and Zhang 2022).

Some, descriptions of the steps of project-based learning, in accordance with research (Nirmaryani., et al, 2021), namely designing activities with fundamental questions, developing projects, preparing schedules, presenting and monitoring, evaluating projects (Laili, Ganefri, and Usmeldi 2019); (Izati, Wahyudi, and Sugiyarti 2018).

3) Feasibility of Project-Based Learning-Based eBook 'Critical and Creative Reading' to Improve Students' Critical Thinking Skills

The product feasibility test in this study was carried out on material experts and graphic experts. The material experts and graphic experts are lecturers at the Master of Indonesian Language and Literature Education Study Program, FBSB, Yogyakarta State University. The feasibility test was carried out to assess the feasibility of the products developed in terms of material and graphics. The following is a tabulation of data on the results of the material and graphic feasibility test.

Table 3. Recapitulation of Expert Assessment Results

No	Expert Test	Score	Description
1	Material	3.40	Good
2	Graphic	4.65	Very Good

The steps taken in conducting this research's grading test, namely, (1) providing questionnaires and products to each expert, both material experts and grading experts; (2) calculating the results of expert assessments, with a five-scale guideline; (3) making revisions based on expert suggestions. Based on the material expert's assessment of the material feasibility aspect, the score was 3.56 with a good category, the material expert's assessment of the learning aspect was 3.30 with a fairly good category, so that the average material expert validation test obtained a score of 3.40 with a good category. Next, the assessment of the graphics expert regarding the display feasibility aspect obtained a score of 4.44 with a very good category, the assessment of the graphics expert regarding the feasibility of programming obtained a score of 4.71, the graphics regarding the feasibility of product comfort obtained a score of 5.00 so that the assessment, the graphics expert obtained an average of 4.65 with a very good category. After the assessment, it is continued with revising according to expert advice, and continued at the student response test stage.

The student response test was conducted on 1 critical and creative reading class in the Indonesian Language and Literature Education Study Program, FKIP, Ahmad Dahlan

University. The response test was conducted to find out student responses related to the project-based learning-based critical and creative reading electronic book developed. At this stage, the questionnaire was filled in by 5 students who were randomly selected. After filling out the questionnaire, the student response assessment score was calculated using the Aiken V formula.

Based on the calculation using the formula, the score was obtained between 0.9-1. This has been adjusted to the opinion of Retnawati (2015:19) which states that. from the results of the calculation of the V index, in the Aiken correlation, an item can be categorized or concluded based on its index. If the index is less than or equal to 0.4, it can be concluded that the validation is less; 0.4-0.8 is categorized as moderate validation, and if it is greater than 0.8, it is categorized as very valid. In relation to the results of the student response test above, the project-based learning-based critical and creative reading electronic book received positive responses from students, so the product is feasible.

4) Effectiveness of Project-Based Learning-Based eBook 'Critical and Creative Reading' to Improve Students' Critical Thinking Skills

The effectiveness test was conducted to determine the effectiveness of the product developed in improving students' critical thinking skills. The results of the effectiveness test through the SPSS program can be seen in the following figure.

Table 4. Product Effectiveness Test Results
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Berpikir Kritis Awal	Equal variances assumed	1.483	.243	.914	14	.376	2.50000	2.73453	-3.36499	3.36499
	Equal variances not assumed			.914	13.562	.377	2.50000	2.73453	-3.38269	3.38269
Berpikir Kritis Akhir	Equal variances assumed	.235	.635	4.312	14	.001	15.00000	3.71057	8.04176	21.95824
	Equal variances not assumed			4.312	13.750	.001	15.00000	3.71057	8.02515	21.97485

The effectiveness of the developed product, project-based learning-based eBook 'critical and creative reading' to improve students' critical thinking skills, is seen from the results of the field trial, the pretest and posttest results of the experimental and control classes. The results of the pretest analysis of the control and experimental groups showed that the p-value = 0.376. It shows that the p-value > 0.05, so H₀ is accepted. Thus, the level of critical thinking students or critical thinking skills of students before treatment between the experimental group and the control group is not significantly different. Based on the results of these calculations, before the treatment, the level of intelligence between students in the experimental and control classes was balanced. Next, the results of the posttest analysis between the control and experimental groups, in this case after the treatment, obtained a p-value of 0.001. The data shows that the p-value < 0.05, so H₀ is rejected. Thus, students' critical thinking skills after treatment between the control and experimental groups are significantly different.

Based on the data above, related to the significance of the data contained in the student pretest between the control and experimental classes is not significantly different, H₀ is accepted. Then, based on the posttest results, the results are significantly different. Learning using critical and creative reading electronic books based on project-based learning can improve students' critical thinking skills, rather than learning that does not use these products. The results of these findings are very related and support the results of research

conducted by (Mitchell, 2018); (Krisbiono, 2015); (Salampessy and Suparman 2019), which states that the development of teaching materials, is very important to do, because teaching materials can improve students' critical thinking skills, teaching materials that are developed must be collaborated with a model or approach, so as to increase the strength of teaching materials, to train, hone, and familiarize students and students' critical thinking skills.

Conceptual and practical implications with this research, lecturers can have references related to digital teaching materials based on project-based learning that can improve students' critical thinking skills in learning critical and creative reading. For students, this research is implied to provide experience to students to learn to apply project-based learning and lead to critical thinking skills, in critical and creative reading courses through digital teaching materials used in supporting the lecture process. For universities, especially those that oversee the Indonesian Language and Literature Education Study Program, it is implied to be able to provide experience to the university to implement learning in the VUCA era, preparing graduates who are ready to compete according to the challenges in the Main Performance Indicators (IKU) of Higher Education, by presenting teaching materials that can deliver students in achieving learning competencies in the VUCA era to produce graduates who can compete with the times.

Conclusion

The conclusions obtained from the results of this study are as follows; (1) teaching materials used in critical and creative reading courses so far are teaching materials in the form of copies of material from lecturers, journal articles and Tarigan's "reading book as a language skill"; (2) product development is carried out through activities to design materials, models and evaluations that will be compiled in the product, as well as adjusting to product specifications in the form of e-books; (3) the results of the feasibility test to material experts obtained a result of 3.40 with a good category and a graphical expert obtained a result of 4.65 with a very good category.

The results of the response test to students, after being calculated by the Aiken V formula, obtained a score of 0.85 - 1.00 with a very good category. (4) The results of the effectiveness test show that the posttest of the control and experimental classes obtained a result of 0.001, which shows <0.05 H_0 is rejected. Thus, the critical thinking skills of students after treatment are significantly different. So, the teaching materials developed are effectively used to improve students' critical thinking skills.

Recommendation

Based on the exposure in this study, dissemination and further product development recommendations can be put forward, as follows; (1) Electronic-book critical and creative reading based on project-based learning can be used to improve students' critical thinking skills. These results support the theory of learning constructivism, which emphasizes the active role of students in seeking knowledge. On the other hand, project-based learning is highly emphasized today in the Merdeka Belajar Kampus Merdeka (MBKM) program. Reading activities with a project-based learning model invite students to play an active role through the stages of designing, developing, scheduling, presenting, to reporting so that critical thinking skills arise. The teaching materials developed also support the process of critical thinking and creative thinking of students through the process of interpreting readings, applying concepts, analyzing readings, synthesizing, and assessing readings. (2) Lecturers and students can use electronic books for critical and creative reading based on project-based learning to achieve the learning goals of critical and creative reading to

improve students' critical thinking skills. The electronic textbook can be used as an alternative of teaching materials that can continue to be developed by lecturers with other learning models that are in line with the progress of the Times. The development of technology and information in learning requires lecturers to present teaching materials that suit student needs. Thus, the development of teaching materials, especially textbooks, will continue to be carried out.

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