



Development of an Integrated Thematic Learning Module Based on Problem Based Learning to Improve Primary School Students' Critical Thinking Abilities

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Abstract: This research is motivated by the fact that there are still many teachers who teach their students only through thematic textbooks. This research aims to develop an Integrated Thematic learning Module Based on Problem-Based Learning that is valid, practical, and effective in improving the Critical Thinking Ability of Class V Students in Elementary school. The type of research used is Research and Development with the ADDIE development model. Based on the results of the development research carried out, the results obtained were that the validity of the module based on the lesson plan expert obtained an average of 100% (very valid), the material expert validator obtained a result of 91.6% (very valid), the result obtained by the language expert was 76% (valid), and the acquisition of media experts was 69.10% (quite valid). The practicality of the modules carried out by educators and students was carried out as a result of trials carried out on 20 students at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan who obtained a total average of 93.83%, and 90.83%. or in the very practical category. The effectiveness of the module developed was carried out by comparing the critical thinking abilities of students who used the module (experimental group) with students who used school textbooks (control group). In the initial stage, both sample groups were given a pretest with the same level of questions. From the results of the analysis, the average for experimental class students was 25.00, and for control class students, the average was 96.90. This research concludes that the development of an integrated thematic learning module based on Problem-Based Learning to improve the critical thinking skills of fifth-grade students in elementary schools is declared valid, practical, and effective

Keywords: Critical Thinking; Integrated Thematic; Modules; Problem Based Learning

Introduction

Education has become a basic need to improve and develop the potential of human resources. Education is an interaction process that encourages the learning process. Through education, it is hoped that students can develop their potential so that they can become higher-quality human resources. In Law Number 20 of 2003 concerning the National Education System, it is stated that the curriculum is a set of plans and arrangements regarding objectives, content, and learning materials as well as methods used as guidelines for implementing learning activities to achieve certain

educational goals. To improve the quality of education, the government also made efforts to perfect the 2013 Curriculum (M'mboga Akala, 2021).

Since Indonesia's independence, the curriculum has undergone 11 changes. Finally, the curriculum changed from the KTSP curriculum to the 2013 curriculum, integrated thematic learning. Ideally, curriculum changes are planned carefully. Things that need to be done in changing the curriculum include a comprehensive evaluation of the old curriculum, analysis of needs for current challenges, preparation of

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curriculum tools, and optimal socialization (Oeschger et al., 2022); (Okojie et al., 2022). The 2013 curriculum is a curriculum prepared to answer current educational needs towards the challenges of competition for competent human resources globally (Darling-Hammond et al., 2020). The 2013 Curriculum aims to prepare Indonesian people to have the ability to live as individuals and citizens who are productive, creative, innovative effective, and able to contribute to the life of society, nation, state, and world civilization (Maelasari, 2018). 2013 Curriculum Learning, developing integrative thematic learning. This learning tries to integrate each subject into other interrelated subjects, which aims to make it easier for students to understand and interpret each material related to the learning process.

In the current learning process, there are still many teachers or educators who teach their students only through thematic textbooks, while the discussion contained in the textbook is still said to be minimal in its discussion, whereas each lesson consists of several subjects that are combined in thematic learning or the 2013 curriculum so that learning is still less innovative and creative so that the learning tools based on the lessons only rely on teacher books, student books, and makeshift learning media so that the learning process runs normally without any feedback or response from students in learning that is more interesting and more serious in understanding and insight into students' thinking.

The results of interviews with grade 5 teachers show that students are used to learning according to the teacher's guidance in class. The focus of attention highlighted from this interview is the use of teaching materials that do not involve students in developing their thinking abilities. Apart from Student Worksheet books (LKS), the 2013 Curriculum textbooks are also used. However, some teachers feel that the sequence of existing materials and concepts is difficult to apply in learning. The results of several trials using K13 textbooks with students also showed similar results, namely students' difficulty in understanding the sequence of material delivery. Apart from that, the way the problems are presented in the book does not support students in understanding the desired problem. Students are also less motivated to use other books as additional sources for their independent study. Teachers usually use the question-and-answer method in the classroom learning process to make students active, but this cannot ensure that students understand the concepts. Therefore, if in initial learning students are not certain to understand the desired concept, in subsequent learning students tend not to pay attention to the teacher's explanation.

Regarding the problem of lack of student involvement in building understanding of concepts, it results in students easily forgetting the material. This has an impact on the learning outcomes obtained by students. The problems previously explained are also strengthened by the results of documentation from the teacher's archives. So a solution is needed that can help teachers overcome this problem. One form of solution that can be offered is the development of an effective module with a learning model that can help students to be actively involved in discovering concepts from the material they study. A module is a book written with the aim that students can learn independently without the help of a teacher so that the module contains at least all the basic components of teaching materials that have been mentioned previously (Coman et al., 2020). A module developed by one of the learning models offered in curriculum implementation will be able to serve as a guide for teachers in implementing learning. It is hoped that the availability of this module can increase students' activeness and creativity in following the learning process in line with curriculum demands.

One learning model that can be used in preparing modules is the Problem-Based Learning module (Prabasari et al., 2021); (Leny et al., 2021). Minister of Education and Culture Regulation Number 22 of 2016 mandates that the implementation of integrated thematic learning in elementary schools be strengthened by the application of Project Learning, Problem-Based Learning, and Discovery Learning models (Payu, 2023), Critical thinking skills are a competency that must be trained in students because this ability is very necessary for the learning process and life (Raslan, 2023). Critical thinking skills are also defined as students' ability to analyze arguments, make conclusions based on reasoning, assess or evaluate, and make decisions or solve problems (Sellars et al., 2018). Critical thinking skills are part of the thinking skills that need to be optimized through the learning process at school (Widyapuraya et al., 2023).

The learning activities carried out are not only based on the teacher, but are designed to help students develop thinking skills and problem-solving skills, learn adult roles, and become independent learners. This knowledge can have an impact on increasing students' ability to solve problems with more empathy, think critically, and try many different solutions. Based on the description put forward by the researcher, the alternative solution from the researcher is to develop modules using the Problem-Based Learning (PBL) model in Integrated Thematic subjects, therefore the researcher has found the title "Development of Integrated Thematic Learning Modules Based on Problem-Based Learning (PBL) to Improve Critical

Thinking Ability of Class V Students at SD N 197/II Pekan Island".

Method

This type of research is a type of research development (Research and Development) which is oriented towards products developed in the field of education which aims to improve the effectiveness and understanding of students material in learning and its results. (Hamidah et al., 2023), states that research and development is a system of several steps to develop existing products, which can be accounted for. The research uses a research model that is adapted from the ADDIE development model (Analysis, Design, Development, Implement, and Evaluate). The ADDIE model started in the 1990s and was developed by (Zulkifli et al., 2018). The ADDIE model is used to serve as a guide in developing effective training program tools and infrastructure. This model uses 5 stages, namely the Analysis, Design, Development, Implementation, and Evaluation stages.

Research Subjects and Objects

In this development research, the research subjects were 18 students in class V of SD N No 197/II Pekan Island and the object of the research was the development of integrated thematic learning modules based on Problem-Based Learning (PBL) to improve students' critical thinking abilities.

Data Collection Instrument

The instruments used in this development research are: The interview sheet contains questions that will be asked of the fifth-grade teacher at the research school. The interview sheet contains questions about the curriculum used in school. Teaching materials used in schools. Advantages and disadvantages of teaching materials used in schools. Ease and difficulty of using teaching materials at school. The need to develop teaching materials in schools

Questionnaire

A questionnaire is a draft of detailed and complete questions to obtain data. A questionnaire will be used to collect data from a team of experts (Validators). Furthermore, the results of the questionnaire are used as a basis for considering whether Problem-Based Learning modules are suitable for integrated thematic learning. This questionnaire is also used for preliminary studies to determine students' needs with a special questionnaire designed by the developer and assisted by supervisors according to the indicators needed for needs analysis.

Observation

Observation or observation is a way to collect data using the eyes without the help of other standard tools for this purpose (Smit & Onwuegbuzie, 2018), based on the instruments used, observation is divided into two, namely structured and unstructured observation, in the process of collecting observation data divided into participants and non-participants. In this study, researchers used unstructured observation techniques when conducting needs analysis and structured observation techniques when conducting product trials.

Test Technique

This test technique will be used to obtain data from learning outcomes or student evaluations after and before taking lessons or pre-tests and post-tests using the module that will be developed. The value obtained by the researcher will calculate the level of effectiveness of the module in learning.

Documentation

In this data collection technique, the researcher perpetuates activities in the classroom such as distributing needs questionnaires and testing, the data is collected which will later be used as evidence so that the truth can be confirmed.

Result and Discussion

The product created in this development research is an integrated thematic learning module based on Problem-Based Learning to improve the critical thinking skills of fifth-grade students in elementary schools in Theme 4. Subtheme 1. The module was developed using the ADDIE development model, namely: analysis (analysis), design, development, implementation, and evaluation. The results of each development stage are as follows:

Describe the Analysis Results (analysis stage)

The analysis phase was carried out on August 14, 2023. Researchers carried out needs analysis, curriculum analysis, and student analysis. The results of the analysis are described as follows:

Needs Analysis

The needs analysis aims to find out the basic problems needed in developing learning modules and to find out about the advantages and disadvantages of learning modules that teachers have used so far. One of them is analyzing the learning modules used in elementary schools (Syarifah & Yari Dwikurnaningsih, 2022). Analyze whether the learning media is good and under the needs of the learning process. In this case, the needs analysis is carried out by observing schools and

collecting information from various sources such as books, journals, expert opinions, and others (Dwivedi et al., 2023).

Based on the results of interviews conducted, several problems were found in the field, including several teachers saying that there were still gaps in understanding the meaning of learning topics. Here the teacher gives a positive impression regarding the development that the researcher will carry out. The teachers support what the researchers are planning, and ask a lot of questions regarding the process of developing this module, and it is hoped that this will make it easier for children to learn to improve their problem-solving abilities.

Learner Analysis

Researchers analyzed the characteristics of fifth-grade students. Class V students aged 10-11 are at the level of development of logical thinking and can solve abstract problems. Here children can express their opinions. The age of the students found by the researchers will also be matched with learning theory so that there are no gaps.

Curriculum Analysis

The curriculum analysis stage is carried out using KD analysis to create indicators. Based on these metrics, learning objectives achieved by students are formulated. Apart from that, the design of module development indicators is also used in Theme 4. Subtheme 1 in class V.

Design Stage (design)

This design or design stage is carried out to prepare materials and design (design) the module. The design stage includes: preparing the instrument and designing the module:

Instrument Preparation

Researchers prepare a module validity sheet instrument to measure how feasible the module can be used for the learning process and assessed by experts or expert validators. The validation sheet prepared is in the form of a material, language, and media validation sheet. Researchers also created practicality questionnaires for students and questionnaires for teachers so they could find out how practical the modules being developed were (Lestari et al., 2019). Finally, the researcher developed a test instrument that aims to obtain data about students' ability to understand and master the learning material after using the PBL-based module.

Designing Modules

At this stage, the researcher uses an integrated thematic learning module based on Problem-Based

Learning to improve the critical thinking skills of fifth-grade students in elementary schools on Theme 4. The format for the preparation is as follows.

Module format

In the initial display, a home menu is presented in the form of a cover that describes the theme of the material that students will study. Furthermore, Core Competencies are given to make it easier for students to understand the competencies they will master.



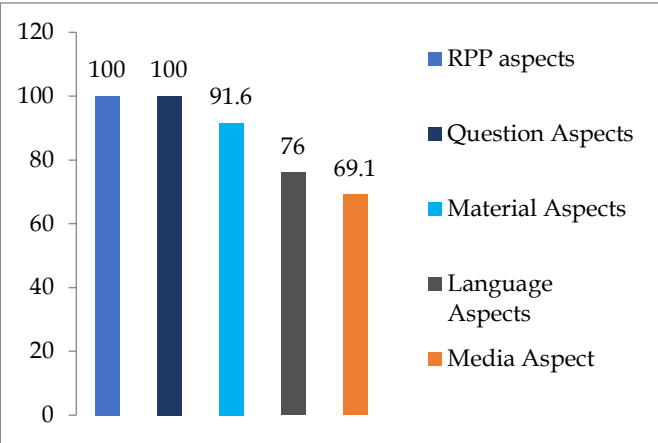
Figure 1. Cover appearance

KOMPETENSI INTI DAN KOMPETENSI DASAR	
IPA	BAHASA INDONESIA
<p>3.4 Menjelaskan organ peredaran darah dan fungsinya pada hewan dan manusia serta cara memelihara kesehatan organ peredaran darah manusia. (C1)</p> <p>4.4 Menjelaskan karya tentang organ peredaran darah pada manusia. (P1)</p>	<p>3.6 Menggali isi dan anatomi puisi yang disajikan secara lisan dan tulis dengan tujuan untuk kesenangan. (C4)</p> <p>4.6 Melakukan puisi hasil karya pribadi dengan lafal, intonasi, dan ekspresi yang tepat sebagai bentuk ungkapan diri. (P4)</p>
DESKRIPTOR	
<p>3.4.1 Menganalisis organ peredaran darah pada manusia. (C4)</p> <p>3.4.2 Menjelaskan fungsi organ peredaran darah pada manusia. (C1)</p> <p>4.4.1 Membuat laporan hasil pengamatan video tentang siklus peredaran darah manusia. (P2)</p>	<p>3.6.1 Menganalisis ciri-ciri Puisir (C4)</p> <p>3.6.2 Menggali isi dari Puisir (C)</p> <p>4.6.1 Mendeskripsikan sebuah Puisir (P4)</p> <p>4.6.2 Melakukan puisi dengan lafal yang tepat (P4)</p> <p>4.6.3 Melakukan puisi dengan intonasi yang tepat (P4)</p> <p>4.6.4 Melakukan puisi dengan ekspresi yang tepat (P4)</p>
<p>SANTIAH OKTARISMA Modul Yurastik Berbasis Riset Problem Based Learning</p>	

modules, while the RPP in the researcher's control class uses scientific learning steps.

Expert Validation Results

The problem-based learning module developed is assessed from the material, language, and media aspects. The RPP aspect was assessed by Mrs. Prof. Dr. Yanti Fitria, M.Pd, and Prof. Dr. Risda Amini, MP. The validation results can be summarized in the following figure.



Implementation Stage

Individual trials consisted of 5 students from SDN 127/II Sungai Arang and 5 students from SDN 197/II Pulau Pekan, then the trials were carried out in a larger field with 20 students. By using and evaluating the product by filling out a response questionnaire for students. This is intended to assess the practicality of the learning module.

Module Practicality Test Results

Individual Trial Results (10 Students)

Individual trials were carried out on 5 students of SDN 127/II Sungai Arang and 5 students of SDN 197/II Pulau Pekan as representatives of their respective schools. Results of individual PBL-based module trials at SDN 127/II Sungai Arang. One to One Evaluation (Individual Trial) is important to carry out to see the shortcomings and suggestions of the product being developed (Subbiah, 2023), It can be summarized in the following table 1.

Table 1. Results of Individual Trials at SDN 127/II Sungai Arang (5 Students)

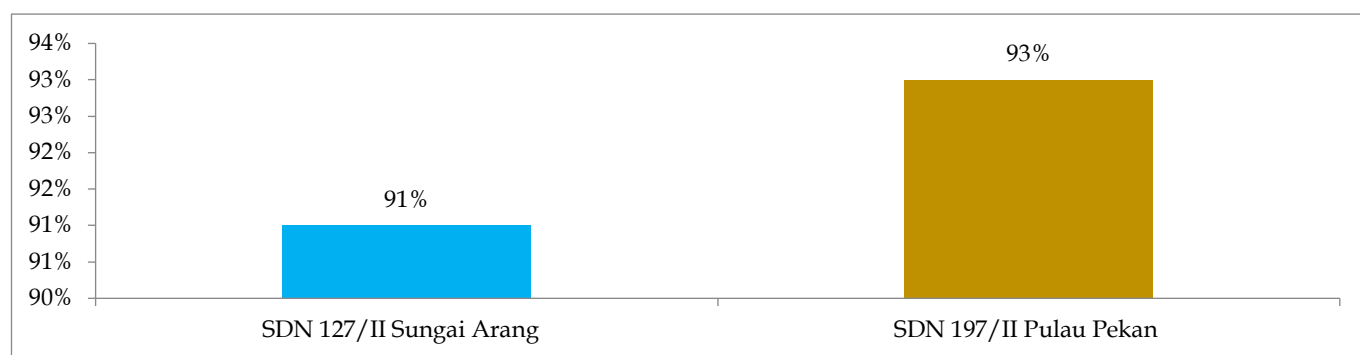
Assessment Aspects	Student 1	Student 2	Student 3	Student 4	Student 5
The module presentation is interesting and easy to understand	18	18	18	19	18
The modules developed to improve the learning process	8	6	8	6	7
Learning modules that can be utilized and help independent learning	8	8	8	8	7
Increase effectiveness in understanding concepts	4	4	3	4	3
The learning module is equipped with images and colors so that it can help understand the material and apply it in everyday life	7	6	8	6	7
The exercises contained in the learning module can be a benchmark in understanding the learning material and facilitate other evaluation activities	12	12	12	12	10
Number of values	57	54	57	55	52
Maximum score	60	60	60	60	60
Total number					275
Average Validity Percentage					91%
Validity category					Very Valid

Based on the data in the table, it can be explained that the results of individual trials on 4 students for using the module, obtained a total average of 87.58% or in the very practical category.

The results of individual trials carried out at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan can be seen in the figure 4.

Table 2. Results of Individual Trials at SDN 197/II Pekan Island (5 Students)

Assessment Aspects	Student 1	Student 2	Student 3	Student 4	Student 5
The presentation of the module is interesting and easy to understand	20	18	19	19	18
The modules developed to improve the learning process	8	8	7	6	7
learning modules that can be utilized and help independent learning	8	6	7	7	8
increase effectiveness in understanding concepts	3	4	4		4
The learning module is equipped with images and colors so that it can help understand the material and apply it in everyday life	8	7	8	8	8
The exercises contained in the learning module can be a benchmark in understanding learning material and facilitate other evaluation activities	12	12	12	12	12
Number of values	59	55	57	52	57
Maximum score	60	60	60	60	60
Total number					280
Average Validity Percentage					93%
Validity category					Very Valid

**Figure 4.** Results of individual trials at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan*Small Group Trial Results (10 Students)*

Small Group Evaluation (Small Group Trial), small group trials involving 8 to 20 subjects in developing products (Grijpma et al., 2022). In this research, small

group trials were carried out on 10 students. The results of small-group trials can be summarized in the following table 3.

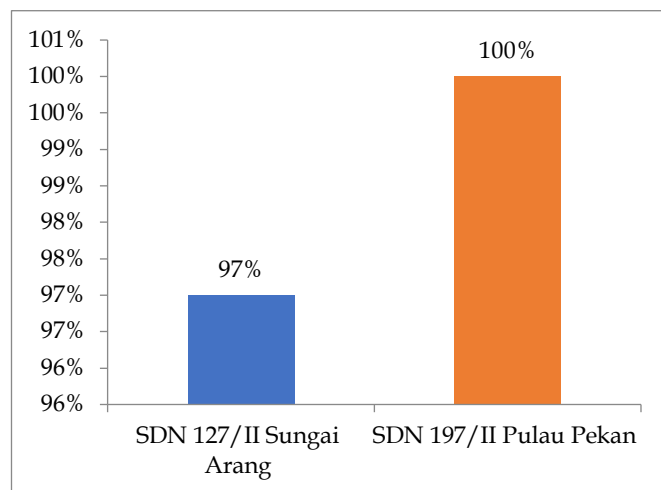
Table 3. Results of Small Group Trials at SDN 127/II Sungai Arang (5 Students)

Assessment Aspects	Student 1	Student 2	Student 3	Student 5
The module presentation is interesting and easy to understand	20	20	19	18
The modules developed to improve the learning process	8	8	7	7
Learning modules that can be utilized and help independent learning	8	8	8	7
Increase effectiveness in understanding concepts	4	4	4	4
The learning module is equipped with images and colors so that it can help understand the material and apply it in everyday life	8	8	8	8
The exercises contained in the learning module can be a benchmark in understanding the learning material and facilitate other evaluation activities	12	12	12	12
Number of values	60	60	58	56
Maximum score	60	60	60	60
Total number				234
Average Validity Percentage				97%
Validity category				Very Valid

Table 4. Results of Small Group Trials at SDN 197/II Pekan Island (5 Students)

Assessment Aspects	Student 1	Student 2	Student 3	Student 5
The module presentation is interesting and easy to understand	20	20	20	20
The modules developed to improve the learning process	8	8	6	8
Learning modules that can be utilized and help independent learning	8	11	8	7
Increase effectiveness in understanding concepts	4	4	4	4
The learning module is equipped with images and colors so that it can help understand the material and apply it in everyday life	8	11	7	8
The exercises contained in the learning module can be a benchmark in understanding the learning material and facilitate other evaluation activities	12	12	11	12
Number of values	60	66	56	60
Maximum score	60	60	60	60
Total number				242
Average Validity Percentage				97%
Validity category				Very Valid

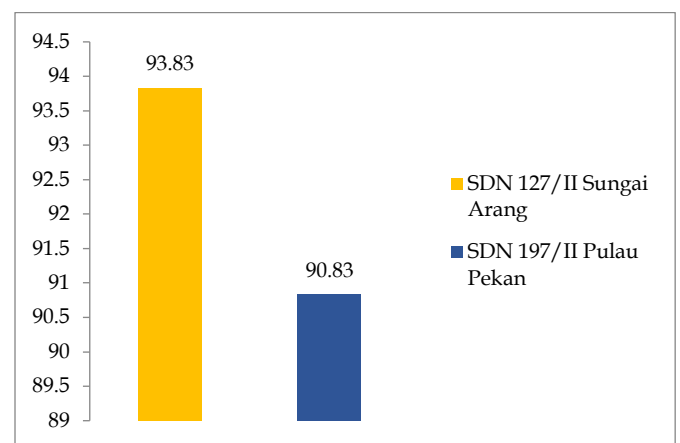
The results of small group trials carried out at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan can be seen in the figure 5.

**Figure 5.** Small group trials were carried out at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan.

Limited Group Trial Results

Limited group trials were carried out at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan with 20 students and 1 homeroom teacher. Briefly, the results of

the student questionnaire can be explained in the following figure 6.

**Figure 6.** Limited Group Trial

Based on the data in the picture above, it can be explained that the results of group trials limited to 20 students for using the module, obtained a total average of 93.83%, and 90.83% in the very practical category. Furthermore, the results of the questionnaire responses from educators or teachers when using the module can be briefly presented in the following table 5.

Table 5. Teacher (Educator) Response Results

Assessment Aspects	Student 1	Student 2
The module presentation is interesting and easy to understand	18	18
The modules developed to improve the learning process	8	6
Learning modules that can be utilized and help independent learning	8	8
Increase effectiveness in understanding concepts	4	4

Assessment Aspects	Student 1	Student 2
The learning module is equipped with images and colors so that it can help understand the material and apply it in everyday life	7	7
The exercises contained in the learning module can be a benchmark in understanding the learning material and facilitate other evaluation activities	12	12
Number of values	57	55
Maximum score	60	60
Total number		112
Average Validity Percentage		93
Validity category		Very Valid

Based on the table 5, it can be explained that the results of teacher (educator) responses carried out in the trial class and experimental class obtained a total average of 93% in the very practical category. Thus, based on the results of student response questionnaires and teacher response questionnaires on integrated thematic learning modules based on Problem-Based Learning to improve the critical thinking skills of class V students in elementary schools in Theme 4. Overall, Subtheme 1 is classified as very practical for use in elementary schools.

Evaluation Stage (Evaluation)

The evaluation stage consists of three stages, namely the first stage (conducting a pre-test), the second stage (learning process), and the third stage (conducting a post-test). The effectiveness of the products that have been developed is analyzed based on the results of tests completed by students using the Pretest-Posttest Control Group Design. In this design, two sample groups were taken, namely the experimental group which would use the module, and the control group as a comparison (using printed books from the government). Descriptions of the pretest data and posttest data for the two sample groups are briefly summarized in the following table.

Table 6. Description of pretest and posttest data

Result	Class	\bar{x}	X min	X max	S
Pretest	Experiment	25.00	10	40	13.45
	Control	96.90	10	70	11.82
Posttest	Experiment	56.70	50	70	13.45
	Control	54.60	30	70	11.82

The results listed above explain that students in the experimental class obtained an average pre-test score of 25.0 with the lowest score being 10 and the highest score being 40, while students in the control class obtained an average pre-test score of 96.9 and the lowest score. 10 and the highest score was 70. Furthermore, the posttest

results for students in the experimental class who used the module obtained an average score of 56.7 with the lowest score being 50 and the highest score being 70. Meanwhile, for the control class, the posttest average was 54.6 with the lowest score being 30 and the highest 70.

Description of pretest and posttest data on the use of integrated thematic learning modules based on Problem-Based Learning to improve the critical thinking skills of fifth-grade students in elementary schools in Theme 4 in the experimental and control classes can be seen in the following picture:

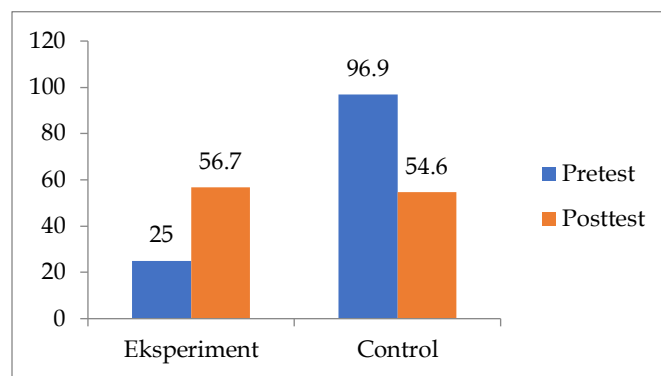


Figure 7. Average Pretest and Posttest

Calculation of variance and standard deviation values aims to determine the diversity of a group of data. Calculating the standard deviation from the table above also reveals that the variance or diversity of the experimental group is almost the same as the control class.

The module was designed based on integrated thematic learning based on Problem-Based Learning to improve the critical thinking skills of fifth-grade students in elementary schools which were developed using the ADDIE development model which was declared valid, practical, and effective for use in theme 6 (heat and its transfer).

Module Design

After going through the analysis process, the initial product was designed in the form of an attractive

module and its presentation was adjusted to the students' abilities. The material contained in the module is also adapted to the child's competencies and abilities related to students' daily lives. This module is designed based on integrated thematic learning based on Problem-Based Learning so that students are more interested in the presence of interesting images in understanding the activities contained in this module (Handayani, 2018); (Dayagbil et al., 2021). Learning using modules can be done repeatedly to understand all the material. So that it can foster students' learning motivation and independence, especially in improving students' critical thinking abilities. This is because the module is equipped with instructions for use, KI, KD, indicators, learning objectives, material concept map, practical activities, and evaluation.

Feasibility (Validity) of the Module

The feasibility of the module has been developed and obtained from the results of validation (assessment) by material, language, and media experts. The validation results for the module by RPP expert validators obtained an average of 100% with a very valid category. Material expert validators obtained an average total score of 91.60% or could be categorized as very valid. Furthermore, validation carried out by language experts obtained an average total score of 76% or was categorized as valid. Furthermore, the assessment results by media expert validators obtained an average total score of 69.10% or were categorized as quite valid. The module feasibility test is carried out so that researchers know how feasible this module can be if the validator's assessment meets the percentage results of $\geq 61\%$ with a valid to very valid category (Kustijono & Budiningarti, 2018). So, the module is said to be suitable for use in the learning process (Mahardika et al., 2020). The results of validation (assessment) by material experts, language experts, and media experts show that the module design meets the validity or feasibility criteria (very valid). However, there are still several improvements or revisions based on suggestions from material, language, and media experts. After making improvements to the module, the researcher then consulted and checked again with the expert validator. Based on the results of consultation and re-examination by the validator, the module was declared feasible and can be tested in schools.

Module Practicality

To see the practicality of the module, researchers conducted trials in the field. Trials were carried out to analyze suggestions and responses from students and teachers in using the product. The results obtained were obtained and carried out in three stages, the first was

individual trials carried out on 10 students at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan which obtained an average total score of 91%, and 93% can be categorized as very practical. The next stage, namely a small group trial consisting of 10 students who obtained an average total score of 97%, and 100% or categorized as very practical. Furthermore, limited group trials were carried out on 20 students at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan who obtained a total average of 93.83%, and 90.83% or in the very practical category. Furthermore, the researchers also asked for responses from class V elementary school teachers regarding the use of the modules obtained from class teachers from both trial groups who obtained an average total score of 93% which could be categorized as very practical. So, it can be concluded that the integrated thematic learning module based on Problem-Based Learning is very practical and can be used in the learning process in elementary schools.

Module Effectiveness

To analyze the effectiveness of the product being developed was done by comparing the critical thinking abilities of students who used the module (experimental group) with students who used school textbooks (control group). In the initial stage, both sample groups were given a pretest with the same level of questions. From the results of the analysis, the average for experimental class students was 25.0, and for control class students, the average was 96.9. In the next stage, learning is carried out using integrated thematic learning modules based on Problem-Based Learning to improve the critical thinking skills of fifth-grade students in elementary schools in Theme 4. Subtheme 1. For experimental classes, students learn modules. Learning is carried out for approximately two weeks with 2 meetings. Because researchers conducted individual, small-group, and limited-group trials in the first four weeks.

Researchers immediately carried out the learning process with 6JP or 1 x learning time. At the first meeting, the researcher facilitated students to use the module. Meanwhile, for control class students, the learning process uses textbooks available at school. During the lesson, the researcher explained more, and for practical activities only made observations in printed books. After completing the lesson, the researcher gave the students assignments for 5 minutes. After all the material has been studied according to the predetermined schedule. At the final stage of student evaluation, the two sample groups were given a posttest. The posttest score obtained was 56.7 in the experimental class and 54.6 in the control class. The findings of this research are in line with the results of previous research

conducted by (Tong et al., 2022), concluding that module development was feasible, effective and students responded well to the use of the module. Apart from that, it can also improve students' computational thinking skills, obtaining an average n-gain score of 0.66 in the medium category. This is in line with research by (Khasyyatillah & Osman, 2019) concluding that the CT-S module has good validity, improves computational thinking skills, and can help students master learning objectives, further research conducted by (Huang et al., 2023); (Katchapakirin et al., 2022), concluded that using the Scratch module can improve learning outcomes and students' computational thinking abilities is good.

Conclusion

Based on the problem formulation, objectives, and discussion regarding the development of an Integrated Thematic Learning Module Based on Problem-Based Learning to Improve the Critical Thinking Ability of Class V Students in Elementary Schools, it can be concluded that this research produced a product, namely an Integrated Thematic Learning Module Based on Problem-Based Learning which was developed using design. ADDIE development. The development of Integrated Thematic learning modules based on Problem-Based Learning can be declared valid, practical, and effective. Module validity testing based on RPP experts obtained an average of 100% (very valid), material expert validators obtained a result of 91.6% (very valid), language expert results were 76% (valid), and media expert results were 69.1% (fairly valid). Practicality of modules carried out by educators and students. The results of individual trials carried out on 10 students were carried out at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan which obtained an average total score of 91%, and 93% which could be categorized as very practical. The next stage, namely a small group trial consisting of 10 students who obtained an average total score of 97%, and 100% or categorized as very practical. Furthermore, limited group trials were carried out on 20 students at SDN 127/II Sungai Arang, and SDN 197/II Pulau Pekan who obtained a total average of 93.83%, and 90.83% or in the very practical category. The effectiveness of the module developed was carried out by comparing the critical thinking abilities of students who used the module (experimental group) with students who used school textbooks (control group). In the initial stage, both sample groups were given a pretest with the same level of questions. From the results of the analysis, the average for experimental class students was 25.0, and for control class students, the average was 96.9.

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Author Contributions

Conceptualization; S. O., I., R. A., N.; methodology; S. O.; validation; I.; formal analysis; R. A. investigation; N.; resources; S. O. data curation: writing—original; I, draft preparation; R. A., writing—review and editing; N. Visualization; S. O. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The author declares that there is no conflict of interest in the research and publication of this research.

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