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An Integrative Thematic Book: A Textbook Development Oriented Toward The Critical Thinking Skills of Elementary School Students

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***Abstract*—This study aims to (1) develop an integrative thematic textbook for the 1st grade of elementary school oriented to improve critical thinking skills; (2) to know the feasibility level of integrative thematic textbooks (3) to know the level of legibility of integrative thematic textbooks; and (4) to know the level of effectiveness of integrative thematic textbooks in improving students' critical thinking skills of primary schools. This research method used R & D which refers to 4-D model by Thiagarajan. The test substance was the 1st grade primary school student. Data collection used observation method, expert validation, readability test, and critical thinking ability test. Data analysis technique used descriptive and t test. The result of the research indicated that the integrative thematic textbook developed has good feasibility in good criteria, practical readability level and can be applied and easily understood, the effectiveness of the module was tested using t test at 0.05 significance level which result 0.000 <α = 0.05 where the critical thinking ability of students which uses an integrative thematic textbook was better than the critical thinking ability of students which only used ordinary textbooks. This textbook can be used to develop the critical thinking skills of elementary school students, especially in low classes.**

Keywords*—*textbooks, integrative thematic, critical thinking skills, elementary school students

I. INTRODUCTION

The ability to think critically is a very essential skill in all aspects of life. The significance high level of thinking competence for learners is very important in global competition era because the level of complexity of problems in all aspects of modern life keeps higher [1] Students who have the ability to think critically will have the ability to solve every problem well. Furthermore, this ability can have a positive impact on environmental problem solving [2]. Therefore, the ability to think critically should be nurtured early from the elementary school level. It should even be implanted at home as well as in the community environment [3].

Indonesia is enacted a new curriculum for all levels of education that is the curriculum 2013 (K13). The curriculum is also applied at elementary level (elementary school and madrasah Ibtidaiyah/MI). At the elementary school level, the 2013 curriculum uses an integrated thematic learning approach that is applied to all classes. The underlying reason for using the learning approach is referring to the view of developmental psychology where the primary school children thinking are still holistic. Based on that view, the curriculum's curriculum separately does not provide an advantage for thinking skills in the next stage. Competence is a goal that students must achieve from a curriculum. With regard to competence, in the curriculum 2013 there are two competencies which are Core Competence (KI) and Basic Competence (KD). Core Competence (KI) is a translation or operationalization of Graduate Competency Standards (SKL) in Education Unit Level Curriculum (KTSP). In KTSP, the competencies that must have students include the aspects of knowledge (cognitive), attitudes (affective), and skills (psychomotor) but, in the curriculum 2013, the competencies students must possess emphasize the new attitude (affective) aspects of knowledge and application of knowledge.

K13 facilitates students to think high-level (HOT). One of way in achieving the ability to think is supported by several components is using textbooks. Therefore, the presentation of textbook content cannot be separated from other learning components such as the curriculum being applied, the media, the approach, and the characteristics of the students. The critical thinking skills that students should have in

contrast to the state of the basic school students. Based on the results of preliminary observations, students' critical thinking skills are classified as low. It is shown that, most students are not able to provide an alternative problem solving, and make a conclusion.

In fact, the content of textbooks is less in facilitating students in growing the ability to think critically. In other words, the device that was created only focused on the cognitive aspect only, so that other aspects were not considered. [4] Based on the observations, the researchers found several facts related to the presentation of textbooks used in the first grade of primary school include 1) using the theme as the focus of discussion but, material content is limited to a single subject area; 2) the material and illustrations presented do not pay attention to the students' way of thinking; 3) improper use of grammar, so difficult to understand its meaning; 4) there are some tasks that are not in accordance with the basic competence; 5) writing a few sentences and illustrations brings up many predictions. Other facts found from the aspects of teachers and students related to the used of textbooks are 1) teachers explain one by one material in textbooks, regardless of learning objectives and competencies that must be mastered by the students; 2) the task (item) is adopted from the textbook, without any effort to connect with the learning objectives and competencies that must be mastered by students; 4) students mistakenly carry textbooks and sometimes left at home; 5) students put some textbooks on the table according to the theme being studied. The findings of facts related to the presentation and textbooks used. It can be concluded that textbooks become an important component of learning activities. From the aspect of the presentation of the content, there are some shortcomings that cause some problems. Based on some facts and plans of curriculum implementation of 2013, it is necessary to develop a textbook for 1st grade of elementary school that is oriented to critical thinking ability. Based on the approach of learning in curriculum 2013, the textbook developed is Integrative Thematic Textbook (BATI).

II. Literature Review

A. Critical Thinking Ability

Critical thinking is a mental activity which are activities analyzing problems, solving problems and making conclusions [5]. Furthermore, Johnson and Lamb argue that critical thinking involves logical thinking and reasoning which includes the skills to make comparisons, classifications, sorting, cause and effect, patterns, analogies, deductive thinking, and inductive reasoning, hypothesizing, and critical review [6].

If the ability to think creatively is divergent, the ability to think critically is more convergent. This ability produces students who have the ability to find the right answers to a questionable problem to the student. The critical thinking ability of a student can be identified by asking questions and asking the student to answer the question. The question posed is a question that allows students to simulate the knowledge they possess to build new knowledge.

Developing critical thinking skills is an activity to integrate the development of several capabilities such as observation (observation), analysis, reasoning, judgment, decision making, and persuasion [7]. Developing these skills will result in the ability to overcome problems with satisfactory outcomes. Critical thinking is an ability that needs to be sharpened continuously. The more teachers train students to think critically, the more the ability to think critically is sharp.

Learning activities that can develop students 'critical thinking skills can hone students' thinking skills at a high level. It can be done by familiarizing students with problems by providing questions and problems that lead students to think critically. At first, students may be frightened and do not have the courage to deliver the answer. This is quite natural because most of the learning activities in schools do not have led to the learning of critical thinking. To overcome this teacher should be patient and still guide students with diligence. The students who are over time will get the questions and problems, so the longer will be more challenged to solve the difficult problems increasingly.

Learning with small discussions usually can train students to think critically. Students are belonging to small groups will have the opportunity to clarify their understanding and evaluate other students' understanding, observe other people's thinking strategies to be role models, help other undergraduates to build an understanding of motivation, and to shape the necessary attitudes such as accepting criticism and criticizing polite way.

B. Characteristics of Elementary School Students

First grade students of elementary school are children who are in preoperative stage (age 2-7 years) toward the early stage of concrete operation (age 7-11 years). According to Piaget's cognitive development theory, at that age the child has a way of thinking that is transient (paying attention to one aspect of a particular object or situation is seen as a unified whole). At the beginning of concrete surgery the child's way of thinking is still centrally, but at this stage his logical reasoning ability begins to develop like comparing and solving problems. However, it can only be used when dealing with familiar situations as well as real (concrete) things.

A teacher should be able to apply teaching methods that are appropriate to the circumstances of his students, so it is important for an educator to know the characteristics of his students. In addition, the characteristics that need to be considered also is the

learners' need. Understanding the characteristics of learners and developmental tasks of elementary school children can be a starting point for determining educational objectives in primary schools and to determine the right time in providing education in accordance with the needs of the child's own development. Ideally, in order to achieve students' self-development, schools and teachers should be able to provide and meet the various needs of students in order to achieve student self-development.

Primary school-aged children must pass through the developmental stages well [8]. The child's thinking level in learning is holistic. Therefore, learning should refer to the theme. The principle of choosing a theme related to the life of the soul has relevance to the problems faced by students in their life. Every problem faced needs to be solved and to solve the problem required an analytical thinking activity is often called as critical thinking.

III. MATERIAL AND METHODOLOGY

A. Method

The type of research used in research and development (R & D) is a research method used to produce a particular product and test the effectiveness of the product. There is an integrative thematic textbook development that is oriented to critical thinking ability. This research material development path follows the Four-D Model. The four-stage model consists of defining, designing, developing, and disseminating.

B. Data Collection Technique

Data collection techniques use the method of observation, expert validation, legibility test, and critical thinking skills test.

IV. RESULT AND DISCUSSION

A. Result

1) Validation Results of Feasibility of Integrative Thematic Textbooks

Based on table I, the results of the two validities assessment, the content, presentation, language, and typography aspects show the average total score of 3.3 with the appropriate criteria. Based on the validator's descriptive note, it is written that the developed book is worth using with a little revision.

TABLE I. AVERAGE SCORES VALIDATION RESULTS

No.	Aspect	V 1	V 2	Mean
1.	Contents	3,5	3,1	3,3
2.	Presentation	3,2	3,5	3,3
3.	Language	3,4	2,8	3,1
4.	Typography	3,7	3,5	3,6
		∑ = 3,5	∑ = 3,2	∑=3,3

Based on Table II, it is known that the percentage based on validation by two experts is 83% with the criterion is feasible.

TABLE II. PERCENTAGE OF BATI VALIDATION RESULTS

No.	Aspect	Mean	Presentage (%)
1.	Content	3,3	83%
2.	Presentation	3,3	83%
3.	Language	3,1	79%
4.	Typography	3,6	89%
	∑ = 4	∑ = 3,3	∑=83%

2) T-test on Pretest Experiment and Pretest Control

To know the result of pretest hence the equality test of variance, in test of equality of variant of number F is used to assume the two variants equivatively (equivalance variances assumed). In table III, it is known that the value of F value is 0.199 or greater than 0.05. Based on the number F which assumes the two variants is the same that is 0.199 with probability (sig) of 0.658. Because probability numbers > 0.05, it can be seen that there is no variant difference between the experiment and the control.

TABLE III. GROP STATISTICS

Class	N	Mean	Std. Deviation	Std. Error Mean
Experiment	20	45,75	19,952	4,461
Control	20	48, 50	19,808	4,429

Based on table 4, t tests which assume the two classes are equal that is 0.437 with probability (sig) of 0.664. Since probability numbers> 0.05, it can be interpreted that there is no significant difference between the initial ability of the experimental class and the control class.

TABLE IV. INDEPENDENT SAMPLES TEST

		Value	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	,199	
	Sig.	,658	
t-test for Equality of Means	T	,437	,437
	df	38	37,998
	Sig. (2-tailed)	,664	,664
	Mean Difference	2,750	2,750
	Std. Error Difference	6,287	6,287
	95% Confidence Interval of	15,477	15,477
	the Difference	9,977	9,977

3) T-Test on Posttest Experiment and Posttest Control

Based on table 6, the number F which assumes the two variants is equal to 0.221 with probability (sig) of 0, 641. Because the probability number> 0.05, it can be interpreted there is no variant difference between the experimental class and the control class.

To find out the comparison of the final test (posttest) it can be seen on the t-test number which assumes the same population that is 4.429 with the probability (sig) of 0.000. Because of probability numbers <0.05, it can be interpreted that there is a difference in posttest value between the experimental class and the control class posttest. It can be concluded, the value of the critical thinking skills of the experimental class is better than the value of students' critical thinking skills of control using ordinary textbooks.

TABLE V. GROUP STATISTICS

Class	N	Mean	Std. Deviation	Std. Error Mean
Exsperiment	20	57,50	20,423	4,567
Control	20	30,50	18,057	4,038

TABLE VI. INDEPENDENT SAMPLES TEST

		Value	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	,221	
	Sig.	,641	
t-test for Equality of Means	t	4,429	4,429
	df	38	37,438
	Sig. (2-tailed)	,000	,000
	Mean Difference	27,000	27,000
	Std. Error Difference	6,096	6,096
	95% Confidence Interval of	14,660	14,654
	the Difference	39,340	39,346

B. Disscussion

1) Integrative Thematic Theme Development Process (BATI)

Learning process development process is through four development processes that have been implemented that is (1) defining phase. This stage consist of early analysis, student analysis, concept analysis, task analysis and formulation of learning objectives; (2) the design stage, this stage consists of the preparation of criteria, the selection of media in accordance with the characteristics of the material and learning objectives, the compilation of Integrative Thematic Indicative (BATI) format, which examines the format of existing teaching materials and set the format of teaching materials that will be developed, and made initial designs in the chosen format; (3) development stage, this stage consists of expert assessment followed by revisions, limited trials followed by revisions based on limited test results, and field trials; (4) spreading stage, this stage comprises a broader trial, assessment of test results, packaging, and dissemination and usage.

2) The Integrative Thematic Textbook Readability (BATI)

The result of BATI readability is obtained from the test result done during the limited trial. From the results of legibility tests conducted on six students, obtained the results of all the correct answers are 62. Based on the score obtained as a percentage, percentage value obtained based on the results that is equal to 69%. The criteria of a percentage value of 69% are easy to understand. Therefore, based on the percentage obtained BATI level of readability for grade 1 primary school students are at the level of easy to understand.

3) Feasibility Level of Integrative Thematic Textbook (BATI)

- Expert Validation Results

  The feasibility of Integrative Thematic Textbook (BATI) is based on the validation results of the experts (validator).

- Material Expert Validation and Curriculum

  Validation made by the material experts includes four components, which are: 1) the feasibility of content with an average score of 3.5 with a percentage of 88%; 2) a presentation component with an average score of 3.2 and a percentage of 79%; 3) language component with an average score of 3.4 with percentage of 88%; 4) typographic component with an average score of 3.7 and a percentage of 92%. The average of the four components when summed is 3.5 and is included in either category and can be used with little revision. The total of the fourth percentage of components is equal to 87% with very decent category.

- Language Validation and Thematic Learning

  Validation conducted by linguists and thematic learning includes four components: 1) the feasibility of the content with an average score of 3.1 with a percentage of 79%; 2) a presentation component with an average score of 3.5 and a percentage of 87%; 3) a language component with an average score of 2.8 with a percentage of 70%; 4) a typography component with an average score of 3.5 and a percentage of 87%. The average of the four components when summed is 3.2 and is included in either category and can be used with little revision. The amount of the fourth percentage of the component is equal to 80% with a decent category

- Integrative Thematic Language Text Validation Results

  Based on the assessment (validation) from both experts, it can be seen the score obtained in the four components of BATI namely; 1) the content component with an average score of 3.3

with a percentage of 83%; 2) a presentation component with an average score of 3.3 and a percentage of 83%; 3) a language component with an average score of 3.1 and a percentage of 79%; 4) typography component with average score of 36 and percentage of 89%.

Based on the validation results of both experts, the average BATI score as a whole is 3.3 with good category and can be used with little revision. The percentage value obtained by the four components is equal to 83% with decent criteria.

- Use of Integrative Thematic Textbooks (BATI) in Improving Student's Critical Thinking Ability

The use of Integrative Thematic Instructional Textbooks (BATI) in improving students' critical thinking skills can be measured by the differences in critical thinking ability tests given to students. the test is performed on students who use BATI and who use regular textbooks, it can be known through the final test result (posttest) given to grade 1 students at SDN Kebonharjo I as a field trial group (experimental group) and grade 1 students in SDN Kebonharjo II as a control group.

The hypothesis that has been formulated will be tested with inferential statistics. Before analyzing the data, first the researchers study the data to be processed. Based on the output with SPSS 18.0, it is known that t test value which assumes both classes is equal to 0.437 with a probability of 0.664. Because probability numbers> 0.05, it can be interpreted that there is no significant difference between the initial ability of the experimental class and the control in critical thinking. Furthermore, to know the difference of students' critical thinking ability using BATI and using the usual textbook, where the output of SPSS 18.0 shows that the t-test number which assumes the variant of both populations equals 4,429 with probability of 0.000. Therefore, probability value <0,05, hence can be interpreted that there is difference of posttest value between student of experiment group and posttest value of student of control group. Therefore, it can be concluded that the critical thinking ability of experimental group students that is class 1 SDN Kebonharjo I by using BATI is better than the critical thinking ability of first grade students in SDN Kebonharjo II using ordinary textbook.

V. CONCLUSION

The development of Integrative Thematic Textbooks (BATI) meets the valid, practical and effective aspects. Valid based on validators'assessment, practical based on legibility test, and effective for improving critical thinking skills of elementary school students. Activity during the Integrative Thematic Bibliography (BATI) development process involves four stages. Stages in the development of BATI consist of defining, designing, developing, and disseminating. The four stages can be accomplished completely without any significant obstacles.

The Integrative Thematic Instructional Textbook (BATI) developed has a defined level of eligibility. In this study, the level of legibility is obtained from the score of the results of the test conducted by six students. The criteria obtained in this study is the level of BATI readability is on the easy to understand criteria with the percentage of 68%.

In addition to measuring the level of legibility, also conducted measurements on the level of eligibility BATI. The result of BATI eligibility is obtained from validation score by two experts. The eligibility criteria obtained in this study reached an average score of 3.3 and a percentage of 83%. With the average score and percentage obtained, BATI's feasibility level is included in the criteria for use.

BATI's eligibility and BATI feasibility level as the basis for BATI can be used in learning activities. The use of BATI aims to determine the improvement of students' critical thinking skills. To know the difference of critical thinking ability, it used two classes that is experiment with control. Based on these results can be concluded that BATI can improve students' critical thinking skills.

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