

Validity of Science Student's Book to Practice Critical Thinking Skills

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Abstract- This research aims to describe validity of students' book for practicing students' critical thinking skills. The research used descriptive quantitative method. Instruments data collection used validation questionnaires. Data analytical techniques used quantitative descriptive data analysis. Research result shows that the validity of students' book and related instruments are declared very valid. Based on the discussion of the results and findings, it was concluded that students' book that have been developed in natural science subject are suitable to be used to practice students' critical thinking skills.

Index Terms- science, students' book, critical thinking skills

I. INTRODUCTION

Critical thinking skills are skills that are very much needed in the 21st century. This critical thinking skill is a challenge in the education system in Indonesia [1]. The importance of having critical thinking skills is also a major aspect of education in Indonesia which is reflected in the Graduates' Competency Standards (SKL) of elementary school students (SD) [2].

But the facts that occur in the field are the implementation of learning does not encourage the emergence of children's critical and creative thinking skills [3]. One of the things that causes the lack of critical thinking skills of children is because when the learning process in the teacher class does not provide opportunities for students to express opinions that are in the minds of students [4].

Based on the results of interviews conducted to elementary school teachers, in terms of learning, subject teachers still explain the material using the lecture method [5]. In the learning process, the teacher has not been able to create conditions and situations that allow students to build critical thinking processes [6]. This can be seen from the activities of teachers and students during teaching and learning activities. The teacher explains the material that has been prepared and provides routine and continuous practice questions. Students only record, copy, and tend to memorize without meaning and understanding.

Furthermore, in terms of the quality of textbooks used by students, the textbooks used do not include indicators of critical thinking [7]. Textbooks are learning manuals that students use to help achieve national education goals [8]. In helping to achieve national education goals, textbooks that are a guide for students must be appropriate. In this case the textbook can function as an intermediary in achieving national education goals. But in fact, the textbooks that hold students in check are not enough to help students achieve national education goals.

To be able to train critical thinking skills, facilitation is needed which can be used as a tool in applying it, one of which can be through textbooks. Validation of textbooks that can train critical thinking skills is needed to provide confidence that the textbooks compiled have relevance of content in the 2013 Curriculum. Therefore, this study was conducted to answer the question of how the validity of science teaching books to train critical thinking skills of elementary school students? The purpose of this study is to describe science teaching books to train critical thinking skills of elementary school students.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

This research is a quantitative descriptive study to describe the validity of Natural Science teaching books based on metacognitive strategies to train critical thinking skills of fifth grade elementary school students. The validity of the teaching book is a very valid, valid, quite valid, and invalid statement made by the validator based on the feasibility mode of the assessment points on the aspects of textbooks. The research subjects were students of Al-Hikmah Elementary School V Surabaya in the even semester of the academic year 2018/2019. Data collection techniques for validating textbooks to train students' critical thinking skills are carried out through validation questionnaires. Validation sheet from experts by giving textbooks that have been designed to two experts (validators) to be assessed and given input in the form of suggestions and criticism. The results of the validation questionnaire and suggestions from the validator are documented. The validator gives an assessment by checking (√) in the appropriate value column. The column contains the assessment scores that have been

determined, on each validation sheet there are four categories, namely: (a) not good (value 1), (b) quite good (value 2), (c) good (value 3), and (d) very good (value 4).

Analysis of data from the teaching book validation was obtained through the values on the expert validation questionnaire sheet. This analysis is done by averaging the scores of each component given by the validators. Data analysis techniques model validation includes textbook validation instruments to train students' critical thinking skills. The data obtained were analyzed by the average score of each aspect. The results of the validation conducted by the validator indicate that the validated textbooks are valid to train students' critical thinking skills.

III. RESULT AND DISCUSSION

This textbook is validated by two validators who are experts in the fields of basic education and learning technology. Validation of textbooks includes the components of content feasibility, components of feasibility of presentation, components of language feasibility, and components of the feasibility of graphics.

A. Component of Feasibility to Fill

The details of the results of the validation of the science textbook developed in the component eligibility content by the two validators are presented in table 1.

Table 1. Results of Content Feasibility Validation

No.	Assessment Aspect	Score			K
		V ₁	V ₂	M	
1.	Completeness of material	4	4	4	Very Valid
2.	Material depth	3	4	3.5	Valid
3.	Accuracy of facts, concepts and principles	4	4	4	Very Valid
4.	Accuracy and suitability of examples/illustrations and questions	3	4	3.5	Valid
5.	Free of SARA, pornography and bias	3	4	3.5	Valid
Validity category mode					Valid

Keterangan:

V1 = Validator 1

V2 = Validator 2

M = Mean value of two validators

K = Category

The results of the validation component of the content obtained from the two validators can be used with a slight revision. Suggestions obtained from the two validators are presented in Table 2.

Table 2. Suggestions for revision of textbooks based on the component of content igibility

Validator	Suggestions	Revision
Validator 1	Water cycle testing steps need to be reviewed. Use easy-to-use ingredients	The material used in the water cycle experiment step is replaced using easily available materials

Based on the data presented in the table 2 . , in terms of the components of content feasibility , the IPA teaching book received an assessment from both validators with the validity of the textbook category category.

B. Component of Content Feasibility

The results of the validation component of the presentation feasibility obtained from both validators can be used (without revision). However, there is one input from the validator 2 to revise the deficiencies in the science teaching book that will be presented in the third paragraph

Table 3. Suggestions for revision of textbooks based on the component of presentation feasibility

Validator	Saran	Perbaikan
Validator 2	1) The space on page 31 needs to be reviewed	1) Spaces are corrected according to the suggestions submitted

The details of the results of the validation of science teaching books developed in the component of the feasibility of presentation by the two validators are presented in T- 4.

Table 4. Results of Validation of Feasibility of Presentation

No.	Aspek Penilaian	Skor			K
		V ₁	V ₂	M	
1.	Systematic consistency in the chapter	4	4	4	Very Valid
2.	Logic / presentation	4	4	4	Very Valid
3.	<i>Advance organizer</i> (learning motivation generator)	3	4	3.5	Valid
4.	There are practice questions at the end of the chapter	3	4	3.5	Valid
5.	There are references / reference sources for text, image tables, and attachments	3	4	3.5	Valid
6.	The accuracy of numbering and naming tables, images, and attachments	3	4	3.5	Valid
7.	Presentation orientation is student-centered	4	4	4	Very Valid
8.	preliminary	4	4	4	Very Valid
9.	Table of contents	4	4	4	Very Valid
10	Glossary	4	4	4	Very Valid
11	Bibliography	4	4	4	Very Valid
Category Validity mode					Very Valid

Keterangan:

V₁ = Validator 1

V₂ = Validator 2

M = Mean value of two validators

K = Category

Based on the data that has been presented in table 4. , in terms of the components of the feasibility of presenting textbooks, the textbooks for science received an assessment from both validators with the validity of the textbook category category.

C. Component of Language Feasibility

The results of the language feasibility validation obtained from the two validators can be used with a slight revision. Suggestions obtained from the two validators are presented in table 5.

Table 5.
Suggestions for revision of textbooks based on the component of language feasibility

Validator	Suggestion	Repair
Validator 1	There are a number of words that are still incorrectly written	Some incorrectly written words are corrected according to PUEBI

The details of the results of the validation of the IPA teaching books are the components of linguistic feasibility by the two validators presented in table 6 .

Table 6. Validity of Language Feasibility Results

No.	Assessment Aspect	Score			K
		V ₁	V ₂	M	
1.	Conformity with the level of development of students' thinking	4	4	4	Very Valid
2.	Understanding of students about the message	3	4	3.5	Valid
3.	The ability to motivate students	3	4	3.5	Valid
4.	The accuracy of grammar and sentence structure as well as the consistency and consistency of the use of symbols / symbols / terms	4	4	4	Very Valid
5.	Linkage and integrity of meaning	3	4	3.5	Valid
Validity category mode					Valid

Keterangan:

V1 = Validator 1

V2 = Validator 2

M= Mean value of two validators

K = Category

Based on the data presented in Table 6 . In terms of the linguistic feasibility component of the textbook, the IPA teaching book received an evaluation from the two validators with the validity of the textbook category category .

D. Kegrafikaan Feasibility Components

The results of the validation of the grammatical feasibility component obtained from the two validators can be used with a slight revision. Suggestions were obtained from both validators presented in Table 7.

Table 7. S aran revision of textbooks based components eligibility kegrafikaan

Validator	Suggestion	Repair
Validator 1	The font type on the cover must be consistent	The font on the cover is consistent

The details of the validation results of the feasibility IPA textbook kegrafikaan by both validators are presented in Table 8.

Table 8. Results of Kegrafikaan Feasibility Validation

No.	Assessment Aspect	Score			K
		V ₁	V ₂	R	
1.	Book size conformity with ISO standards	3	4	3.5	Valid
2.	Suitability with the contents of the book	3	4	3.5	Valid
3.	The appearance of elements of the layout on the front, back, and back cover has unity	3	4	3.5	Valid

No.	Assessment Aspect	Score			K
		V ₁	V ₂	R	
4.	The appearance of elements of the layout on the front, back, and back covers gives the impression of a good and harmonious rhythm	3	4	3.5	Valid
5.	A good center of view on titles and illustrations	3	4	3.5	Valid
6.	The composition of the layout elements (titles, authors, illustrations, logos, etc.) is balanced and has a pattern that matches the layout of the contents of the book	3	4	3.5	Valid
7.	Size comparison of proportional layout elements	3	4	3.5	Valid
8.	Have a good contrast	3	4	3.5	Valid
Validity category mode					Valid

Keterangan:

V1 = Validator 1

V2 = Validator 2

R = Rata-rata nilai dua validator

K = Kategori

Based on the data presented in Table 8, in terms of the components of the feasibility of the academic textbooks, the science teaching books received an assessment from the two validators with the validity of the textbook category category

A. Recapitulation of Results of Science Textbook Validation

Based on the results of the textbook validation in each component of feasibility, the following is the recapitulation of the category of validity mode in each component of the validity of the textbook.

Table 9. Recapitulation of Modes of Validity Category for each Textbook Component

No.	Component of Feasibility	Component Feasibility Category Mode
1.	Content Feasibility	Valid
2.	Feasibility of Presentation	Very Valid
3.	Feasibility of Language	Valid
4.	Feasibility of Kefrafikaan	Valid
Mode for the Feasibility of Textbook		Valid

Based on the data presented in Table 9 . , from the validation of each component of the textbook feasibility, the science teaching book received an evaluation from both validators with valid textbook category validity mode so it can be concluded that science teaching books are based on valid metacognitive strategies to train critical thinking skills of elementary school students

VI. CONCLUSION

The validity of textbooks fulfills very valid criteria, namely in terms of the component of feasibility of contents with an average score of 4, the component of feasibility of presentation with an average score of 4, the component of language feasibility with an average score of 4, and the feasibility component of the average score of 4.

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