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ANALYSIS OF THE SUITABILITY OF SCIENCE TEXTBOOKS SMP GRADE VII (POLLUTED WATER THEME) WITH INDICATORS OF CRITICAL THINKING ABILITY

Rizkiyati Puteri Utami*, Suroso Mukti Leksono, Annisa Novianti Taufik
Science Education Department, Faculty of Teacher Training and Education, Universitas Sultan Ageng Tirtayasa,
St. Ciwaru Raya No. 25 Serang City, Banten, Indonesia

*Corresponding author's email: rielya09@gmail.com

Abstract

This study aimed to analyze the emergence of indicators critical thingking skills in the 7th grade junior high school science learning textbook on the theme of polluted water. The indicators of critical thingking skills that analyzed are focusing on question, analyzing arguments, asking and answering questions, considering whether the source is reliable or not, observing and considering an observation, making deductions and considering, the results of deductions, making inductions and considering the results of induction, making and considering decisions value, define terms and consider definitions, identify assumptions, define an action and interact with others. This research was a descriptive study by using document analysis method to describe the emergence of indicators critical thingking skills in each sub-material component in the science learning textbook. The object of this research was the science leaning textbook published by Kemendikbud, Erlangga and Quadra. The data collection technique used documentation. The instrument used a checklist sheet. Analysis of research data used descriptive statistics by calculating the number of components of the analysis in accordance with the indicators of critical thingking skills. The results of the analysis of the emergence of indicators critical thingking indicators in the three science learning textbooks that were analyzed, the emergence of indicators critical thingking skills obtained the highest percentage in the kemendikbud book of 83,33% very good. Meanwhile, Erlangga's book was 66,67% good and Quadra 56,68% good enough.

Keywords*: Class VII Junior High School Science Learning Textbook, Critical Thingking Ability, Polluted Water.*

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INTRODUCTION

Science learning in the 2013 curriculum is inseparable from the learning tools that are books. Books are used as a source of science learning in the 2013 curriculum in accordance with article 1 of the Regulation of the Minister of Education and Culture of the Republic of Indonesia number 8 of 2018 which states that the main source of learning to achieve basic competencies and core competencies is textbooks. Textbooks are used as the main source of science learning that contains knowledge, skills, and attitudes. In addition, learning textbooks are prepared to provide stimulation to students to get used to critical thinking. Important lesson content at the education level, one of which is Natural Sciences. IPA is one of the fields of study that prioritizes students to be able to reason, critical, scientific and able to collaborate so as to have the ability to overcome problems in daily life (Anjarsari, 2014).

Based on the results of research researched by Sunardjo et al. (2016) shows that the indicators of critical thinking ability in science textbooks on the aspect of giving a simple explanation are presented at 66.67%, in the aspect of building basic skills presented by 83.33%, on the aspect of concluding the presented by 33.33%, in the aspect of further explanation presented by 33.33% and in the aspect of strategies and tactics presented by 33.33%. The results of the above research inform that indicators of critical thinking ability in science textbooks with a representation of 80%. This means that the results prove that each indicator of critical thinking ability is adequately represented by the appearance of each indicator. However, the emergence of each sub indicator on critical thinking ability is still low with the average appearance of each indicator is 50% or with a low category it refers that the science textbook provided by the central government has not fully known the learning needs of learners to form critical thinking skills.

Efforts to build the critical thinking skills of learners through textbooks are used as one of the closest learning media and directly related to learners in learning activities. Textbooks act as tools that play an important role in the learning process in all subjects. One of the teaching materials used to facilitate students in the learning process is textbooks. With the teaching book, it is expected that the learning process can be active and stimulating and develop critical thinking skills based on noble values (Daranto, 2014). One of the

teaching materials used in the learning process is textbooks. Because in this digital era students are easier and more practical to use digital books and the like Susanti & Risnanosanti (2019). The textbooks delivered must be of good quality. Textbooks of good quality need to meet certain standards. One of the standards that must be met to support revolution 4.0 is 4C skills. Therefore, the books used in the learning process must be able to equip learners to develop skills that fit the challenges of the 21st century.

Science textbooks are very necessary to apply 4C skills because it involves students being trained to learn to be active in physical or mental activities, not only covering hands-on activities but also minds-on. In order to build the skills of the 21st century, science textbooks should initiate the thinking process of learners in depth, ranging from formulating questions of natural phenomena (critical thingking), making observations to answering questions that arise (creative thingking), observing the composition of natural processes (contruction of knowledge), analyzing the results of observations (reasoning, analyzing), interpreting observation results (critical thingking and reasoning), drawing conclusions (synthesis and decision making) , until reflecting the results of observations whether it has answered the question that arises (learn to learn). 4C skills need to be in science textbooks to prepare students for global challenges in this era so that students can criticize various symptoms, problems that arise around us related in daily life (Fadillah, 2014). The application of 4C skills in science learning textbooks can have a tremendous influence on learners to face the development of the times.

The cause of students' success in using textbooks is determined by the quality of the textbooks used. The more qualified the textbook, the more perfect the subjects it supportes. Therefore, to support the perfect subjects, it takes the emergence of indicators of critical thinking ability so that the quality of textbooks can develop the critical thinking ability of learners because the indicators of critical thinking ability are inseparable from the activities carried out by learners in learning. Indicators of critical thinking ability analyzed are focusing questions, analyzing arguments, asking and answering questions, considering whether a source is trustworthy or not, observing and considering an observation, making deductions and considering deduction results, making inductions and considering induction outcomes, making and considering valuable decisions, defining terms and considering definitions, identifying assumptions, determining an action and interacting with others (Ennis, 2011). Quality textbooks will help interpret the material students will learn by analyzing, interpreting, evaluating, summarizing, and synthesizing information. Textbook components consist of presentation of materials, sample questions, practice questions, hands on activities, drawings, tables and laboratory activities (Pusat Perbukuan Depdiknas, 2003). In this study, the contents of the book to be analyzed are tables with captions, paragraphs, questions, pictures, training questions and laboratory activities or hands-on activities in the textbooks ipa SMP.

Based on the results of junior high school teacher interviews on the use of textbooks and critical thinking skills that the average teacher uses a learning textbook as a reference in class, one of the science teachers at SMPN 1 Cilegon, Nana Mariyani's mother, S.Pd, explained that every year there is always a revision of the learning textbooks used, then the application of the 2013 curriculum led some publishers to apply books based on the 2013 curriculum which contains critical thinking skills. , but how many categories or aspects of critical thinking skills in a textbook are not yet known in detail. Then some books whose content is quite difficult to digest such as lack of images, practice questions, practical instructions that are difficult to do and there is content that is too simple. Lack of critical thinking ability of learners is influenced by the selection of learning resources in school, because learning resources play an important role in learning activities as a source and media to get information thus it takes a good textbook so that the learning objectives and critical thinking ability levels are achieved equally (Annuuru et al., 2017).

Based on the above series of problems, the researchers are interested in conducting a study entitled "Analysis Of Critical Thinking Ability In Textbooks Of Science Learning Junior High School Grade Vii Polluted Water Theme".

METHOD

This research is qualitative descriptive research. The research method used is the method of document analysis, meaning that in the implementation of this study researchers analyze objects in writing such as books, magazines, documents and so on. The use of this method aims to determine the cuteness of critical thinking ability indicators in science learning textbooks on polluted water themes. The trial is held from November to December 2020. The population of this study is textbooks of science learning in schools. The research samples used are material chapters in the book that integrate the theme of polluted water, such as in water pollution impact chapters, chapters on interaction patterns of living things affecting ecosystems and chapters of mixed separation techniques for water purification in science learning textbooks. The instrument used in this study is a nontest instrument in the form of a checklist list sheet used to analyze the

emergence of indicators of critical thinking ability in science textbooks grade VII polluted water theme. Indicators of critical thinking ability analyzed are focusing questions, analyzing arguments, asking and answering questions, considering whether a source is trustworthy or not, observing and considering an observation, making deductions and considering deduction results, making inductions and considering induction outcomes, making and considering valuable decisions, defining terms and considering definitions, identifying assumptions, determining an action and interacting with others (Ennis, 2011). Data collection techniques used are documentation techniques that are a way of collecting data by collecting and interpreting documents in writing, images or electronics.

This study uses descriptive statistical analysis by calculating the number of analytical components according to the indicators of critical thinking ability. The process of analyzing the data of this research is carried out with the steps as below:

a. Summing up the emergence of critical thinking indicators contained in the analyzed books include subject matter (paragraphs, drawings and tables), exercises and laboratory activities.
b. Calculates the percentage of occurrences of each critical thinking ability indicator in each book analyzed using formulas (Riduan, 2012):

$$\text{Persentase} = \frac{\text{Number of indicators per aspect}}{\text{Number of indicators total aspects}} \text{ X } 100\ \%$$

c. Calculates the average total percentage of occurrences of critical thinking ability indicators in each book analyzed by ipa book analysis assessment criteria using formulas (Riduan, 2012):

$$\text{Persentase} = \frac{\text{Total number of scores per aspect}}{\text{Overall total aspects}} \text{ X } 100\ \%$$

d. Each appearance of critical thinking ability indicators in IPA textbooks is calculated the percentage of conformity based on the percentage of conformity of each indicator as well as the frequency of conformity converted into a percentage form so that the final result of each calculation is in percent for\m. Here are the criteria for assessing the analysis of the book as below:

Tabel 1. Book Analysis Assessment Criteria

Criteria	**Value**
Excellent	81-100%
Good	61-80%
Enough	41-60%
Low	21-40%
Very Low	0-20%

Sumber: (Riduan, 2012)

RESULTS AND DISCUSSION

Based on the results of the study, obtained percentage data on the appearance of critical thinking ability indicators in the textbooks of science learning Junior High School Grade VII polluted water theme. The content of critical thinking ability consists of five aspects namely: providing simple explanations, building basic skills, concluding, making further explanations and organizing strategies and tactics. The following percentage results appear indicators of critical thinking ability peraspek in textbooks learning science SMP Grade VII tainted water theme presented in Table 2:

Table 2. Percentage Results of The Appearance of Critical Thinking Ability Indicators Peraspek In Textbooks Science Learning Tainted Water Theme.

No.	**Aspects of Critical Thinking Ability**	**Book A**	**Book B**	**Book C**
1.	Provide a simple explanation	100%	66,67%	66,67%
2.	Building basic skills	100 %	100%	66,67%
3.	Conclude	66,67%	66,67%	66,67%
4.	Provide a simple explanation	100%	100%	50%
5.	Set strategies and tactics	50%	0%	0%
	Average score of critical thinking ability	83,33%	66,67%	56,68%

The percentage of overall results from the emergence of critical thinking ability indicators in each textbook of science learning junior high school Grade VII polluted water theme is presented in Figure 1:

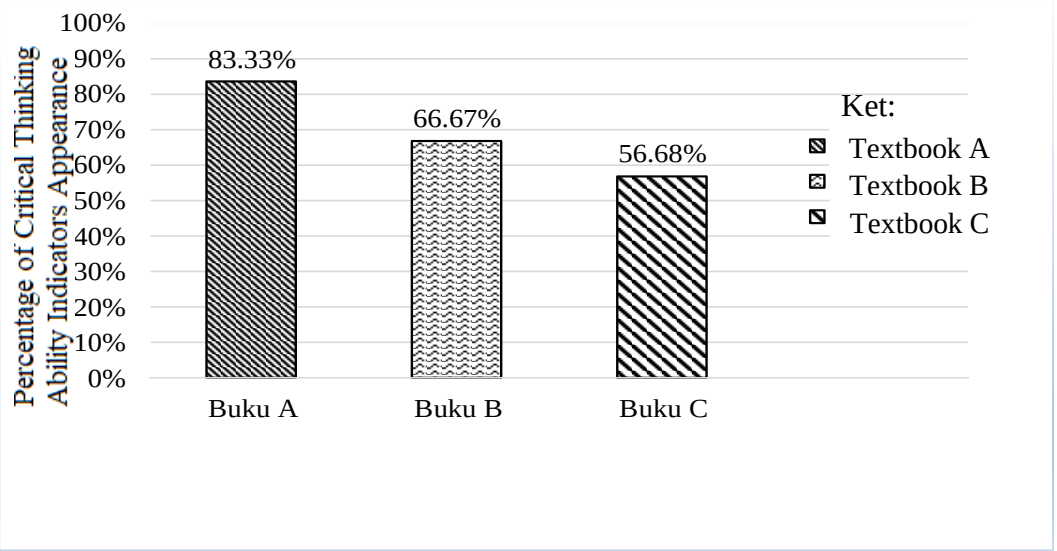

Figure 1. Percentage of Overall Results of The Appearance of Critical Thinking Ability Indicators In Each Textbook Of Science Learning Smp Grade VII Tainted Water Theme

Description:
Book A: Natural Science Class VII Revised Edition 2017 (Kemendikbud)
Book B: Integrated Natural Sciences Volume 1 grade VII SMP/MTS (Erlangga)
Book C: Integrated Natural Sciences 1 for Junior High School Grade VII (Quadra)

Based on figure 1. Textbook A obtained a higher percentage of the appearance of critical thinking abilities than books B and C. Book A obtained a percentage of the appearance of critical thinking ability that is 83.33 % with very good criteria, while from textbook B the percentage of the appearance of critical thinking ability is 66.67 % with good criteria and textbook C the percentage of the appearance of critical thinking ability is 56.68 % of the criteria is quite good. This is because Book A meets more indicators of critical thinking ability, including: focusing questions, analyzing arguments, asking and answering questions, considering whether sources are trustworthy or not, observing and considering observations, making induction and consideration of induction outcomes, making and considering valuable decisions, defining terms and considering a definition, identifying assumptions and interacting with others. Book B only meets several indicators of critical thinking ability, namely: analyzing arguments, asking and answering questions, considering whether sources are trustworthy or not, observing and considering observations, making inductions and considering induction results, making and considering valuable decisions, defining terms and considering a definition and identifying assumptions. The book C slightly meets the emergence of indicators of critical thinking ability, namely: analyzing arguments, asking and answering questions, considering whether the source can be trusted or not, observing and considering the results of observation, making induction and considering the results of induction, making and considering valuable decisions, defining terms and considering a definition.

The high percentage of critical thinking ability indicators in book A is also due to book A containing more contextual material that can be applied in daily life. This is seen from the academic prowess that invites students to be able to think critically, find solutions and emphasize them in their daily lives in the book A. In book A there are pictures presented, contextual examples in each material, experimental activities or hands-on activities that can help the development and knowledge of learners from academic and personal fields. In book A contains many activities that hone learners to think critically, examples of activities in book A such as observing, questioning, exploring, osciating and communicating so that these activities can hone students to be able to think critically (Abdulkarim, 2005). Therefore, book A can support and assist teachers in developing critical thinking skills for students, and book A has been compiled and reviewed by various authorities under the coordination of the Ministry of Education and Culture.

The low percentage of the appearance of critical thinking ability in book C is due to the lack of observation and practice activities compared to books A and B, so book C is less able to develop the critical

thinking skills of learners. Whereas according to Ramda (2017), the higher the percentage of critical thinking skills present in textbooks, the easier it is to develop critical thinking skills for learners.

CONCLUSION

Based on the results of the study can be concluded that book A has the best quality of books compared to book B and book C because it meets many indicators of critical thinking ability. While book C has the lowest book quality only slightly meets the indicators of critical thinking ability. Based on the research that has been done, submitted some suggestions for further research as follows:

1. For the author of the book, it should be the writing of science learning textbooks in addition to referring to the applicable curriculum in Indonesia should also refer to aspects and indicators of critical thinking ability.
2. For other researchers, if you want to do the same research, it is expected to be more understanding and thorough when analyzing the emergence of critical thinking ability indicators in science textbooks. Need to be redeveloped research like this in other science learning textbooks to improve the quality of books that are able to support critical thinking skills.

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