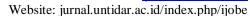
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"Buku IPA Berjendela" A Support for Creative Thinking Skill

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Article History Abstract

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Keywords:

Teaching materials, creative thinking skills, science book, buku IPA berjendela The availability of science teaching materials in SMP and MTs Nurul Muchlishin is limited, especially those that supports creative thinking skill. Thus, some students need to copy the textbook and simple teaching materials with a percentage of 14% and the students' creative thinking skill is low with a percentage of 48%. An effort that can be done in order to overcome this problem is by developing the teaching materials in the form of Buku IPA Berjendela. The objective of this research is to know the advisability and teacher's also students' responses through Buku IPA Berjendela. The type of this research is Research and Development (R & D) and it was developed by using 4D model (Define, Design, Develop, and Disseminate). The result of the study is the advisability of Buku IPA Berjendela on the material content validation is 90.59% (very decent); format validation 94% (very decent); and display validation 94.17% (very decent). Teacher's response is 100% (very good) and students' responses are 99.56% (very good). Buku IPA Berjendela is suitable to be used to train students' creative thinking skill by using many features in the book.

1. INTRODUCTION

Education has an important role in improving human resources quality to develop national civilization. Good quality of education will improve the dignity of the nation in the world context (Shoimin, 2014). The Organization for Economic Cooperation and Development (OECD) in 2015 released the result of a survey from PISA (Program for International Students Assessment) among 69 countries which are evaluated by Indonesia in the bottom seven.

The survey shows that science performance in mastering material in Indonesia is still low, especially creative thinking skill. It is influenced by the selection of teaching materials which is chosen or used by the school. According to Paramita, Rusilowati, & Sugianto (2015), good teaching material contains the component of science literacy materials that almost has a balanced proportion.

Thinking creatively requires students to think well, be able to face problems from many perspectives, and answer it with an unusual answer. (Ministry of National Education, 2011) states that science learning should be done by preparing

students for Science and Technology Literacy, thinking logically, critically and creatively, and thinking well to solve a problem of life.

The observation and interview of the science teacher show that SMP and MTs Nurul Muchlishin applied Kurikulum Tingkat Satuan Pendidikan (KTSP). The problems faced are (1) Teaching materials in the form of a photocopy of science textbook provided by the school and copied by some students, (2) students' ability to solve problems in scientific study is still low because the book which is used does not train students' creative thinking skill.

The observation was also done by giving questionnaires three times on January 6th 2018, January 8th 2018, and January 11th 2018 to the students. The questionnaire results from the need analysis of science learning (78%), teaching material is easy to use (14%), interest in teaching material (79%), adaptation or adaptive (44%), and students' creative thinking skill (48%).

The students of SMP and MTS Nurul Muchlisin are in an Islamic boarding school environment that implements a reading activity

program. The activity is held twice a day which has been regulated in the boarding school Regulation. One of the innovative efforts to overcome those problems is by using *Buku IPA Berjendela*.

Buku Berjendela is a book of compiled papers which can be opened and closed (Ardhana, 2016). There is a hidden part of it that can stimulate students' curiosity. Curiosity means one of the characteristics of creative thinking ability. Curiosity makes students think actively so that they can open up a new world to learn more about science learning (Suhadi, 2010).

The Flap of *Buku IPA Berjendela* is really helping in summarizing the science learning material. Some pictures in the book also can increase students' interest to read. (Barroh, Susantini, & Ducha, 2012) states that the use of pictures for teaching materials can stimulate students' attention and interest.

Oey, Waluyanto, & Zacky (2013) states that Buku Berjendela is an interactive book that the pages should be opened to find out the surprises behind the pages. That opinion is reinforced by Barroh (2012) who states that *Buku Berjendela* is an interactive book which contains some pictures with a window that can be opened up, down, right, or left. In science learning, Buku Berjendela can be used to summarize learning material and students' activities unconsciously seeing, opening, and closing pictures of Buku Berjendela. It can train students' motor skill development and enhance their creative thinking ability.

The advisability is carried out by validating *Buku IPA Berjendela*. Product validation is one of the criteria in investigating whether a product is decent or not (Prabowo, Ibrohim, & Saptasari, 2016).

Dealing with Response, Sumadi (in Kusuma & Aisyah, 2012) defines that it is a reaction or individual response toward situation as a stimulation which can have various forms such as reflex, and so on. A response can also be equalized as a reaction. According to Soemanto in (Kusuma & Aisyah, 2012), a reaction means an impression from observation.

As a result, this research was conducted which aimed to develop *Buku IPA Berjendela* for grade VIII of SMP / MTs in even semester, describe advisability (content, format, and look), and also describing the result of students' and teacher's responses.

2. RESEARCH METHODS

This research belongs to research and development (R&D). It was carried out in two places. They are SMP and MTs Nurul Muchlishin. The subject of the research was 19 students and a teacher.

This research is research that aims to produce a product. This research uses a 4D model by Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (1974) who focus on the education field. The 4D model consists of four stages of development which are: define, design, develop and disseminate.

The instruments used in this research are a validation sheet, a readability test sheet, and questionnaires sheet for the students and teacher. In the stage of development and implementation, the obtained data is in the form of advisability data. The result of advisability data was analyzed by using Likert scale score criteria. The result can be stated as decent if it achieves a minimum score of 61% -80%. The technique of data analysis used in this research is the analysis of product validation.

The result of the data response was analyzed by Guttman's scale score criteria. The result can be stated as decent if it reaches the minimum percentage of 65% - 84%. The technique of data analysis used in this research is the analysis of students' and teacher's responses.

3. RESULTS AND DISCUSSION

This research resulted in some data about: (1) the advisability of *Buku IPA Berjendela* based on the validation of it, and (2) the students' and teacher's responses toward *Buku IPA Berjendela*. The advisability of *Buku IPA Berjendela* can be known by the students' and teacher's responses. The product advisability can be known through the content quality, language, and look assessed by the students and teacher.

The advisability of *Buku IPA Berjendela* was assessed from the assessment instrument of teaching material which was an adaptation from Badan Standar Nasional Pendidikan (Barroh, 2012). The assessment instrument was adapted including 3 aspects. The assessed aspects were material/content, look, and format.

The validation recapitulation of *Buku IPA Berjendela* is presented in Table 1.

Table 1. Validation recapitulation of the content of Buku IPA Berjendela

Explanation	Result of Content Assessment				
	Material	Characterictics of the	Language	Total	
Total	Advisability 491	Book 219	Advisability 214	924	
Percentage of	90,93	91,25	89,17	90,59	
Category	•		·	Very Decent	

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The result of content validation by the expert shows that an average score of 90.59% belongs to a very decent category based on (Setiawan & Wiyardi, 2015). A percentage of shows that the product is very decent to be used because on every indicator in the content material validation from the expert, all indicators include the very decent or very good category (Fatmawati, 2016).

The concept or material provided which is suitable with the curriculum in the school contains contextual knowledge, up-to-date, accurate, content material which is suitable with students' ability, and also can facilitate students' creative thinking skill.

The material in Buku IPA Berjendela does not cause multi-interpretation so that students can learn autonomously without help from the teacher/educator. The teaching material should ease students to learn a particular competence (Prastowo, 2011).

The window (Flaps) in Buku IPA Berjendela has a contribution toward understanding material and has a brief content material but still in accordance with the SK and KD. The picture is clearly presented and there are some pictures which are about the students' daily activities, the pictures are in accordance with the conveyed message and it is hoped that the use of the book will not cause a wrong interpretation.

Table 2. Data of validation result on the Format of Buku IPA Berjendela

Validator	Result of assessment	
Herowati, M.Pd	24	
Ngadi, M.Pd	27	
Tita Tanjung S., M.Pd	28	
Total	79	
Persentage (%)	94	
Category	Very Decent	

It is known that the result of look validation by the expert has the average score of the whole aspect of 94% with a very decent category based on (Setiawan & Wiyardi, 2015).

The physical quality includes layout, punctuation, font and size, cover, and design in general. According to (Sari, 2015) printed teaching materials should focus on several things and one of them is easy to be read. The ease in reading concerns on the font used the size of the text, and easy to be read.

Table 3. Data of validation results on the advisability of Buku IPA Berjendela

	Result of look Assesment			
Validator	Completeness of presentation	Characteristic of the book	Use of Language	Total
Herowati, M.Pd	8	14	16	38
Ngadi, M.Pd	8	15	15	38
Tita Tanjung S., M.Pd	7	16	14	37
Total	23	45	45	113
Persentage (%)	95,83	93,75	93,75	94,17
Category	Very Decent			

It is known that the result of look validation by the expert has the average score of the whole aspect of 94.17% with a very decent category based on (Setiawan & Wiyardi, 2015).

Suhana (2014) declares that teaching material should be compiled and presented interestingly so that it can enhance students' interest and motivation to study. It means that the look of teaching material has an important role to enhance students' learning motivation in learning material.

Students' response was done in two stages. There are initial testing and Quantitative testing. Initial Testing will result in the qualitative data while Quantitative testing will result in a quantitative one.

Before the initial testing, the readability test was done toward 19 students. It was conducted on 12 May 2018. All material was in Buku IPA Berjendela. The readability test was conducted to determine the readability level of Buku IPA Berjendela by circling some difficult words or material by the students. The Data of readability test result can be seen in Table 5.

Table 5. Data on the Results of Trial Readability

Material	Not difficult words (%)	Difficult words
1	99,88	0,12
2	99,94	0,06
3	99,95	0,05
4	99,99	0,01
5	99,93	0,07
Average	99,94	0,06

The data of readability in Buku IPA Berjendela resulted in 99.94% with a very good category. Therefore, it can be used in a trial. Buku IPA Berjendela is very decent since the vocabularies are simple, easy, and short. Thus, students can more understand easily the material. Students prefer to read a book which is colorful and has many pictures rather than black and white. This argument is in accordance with Brown's opinion cited in (Barroh et

al., 2012) who states that students' interest and attention can be stimulated by the use of pictures during the learning process so that students can learn it easily.

Initial Testing was done by simulating the product toward students in the mini class consists of 5 students. It was conducted on May 15th, 2018 in SMP and MTs Nurul Muchlishin. It was done by interviewing 5 students to gain qualitative data.

The qualitative data gained from initial testing was that students respond well toward *Buku IPA Berjendela*. It was developed because it can be easily understood, brief, challenging questions, also there are some pictures about student activities that make students happier and increase students' curiosity to read and learn the book. Even though it is easy to be understood, students said that the paper of the book was wrinkled and there were some pages which the window was pressed against the front page. Therefore, students did not understand the meaning of the sentence that was described.

Quantitative Testing was carried out after revising *Buku IPA Berjendela* based on the suggestion given by students during the initial testing. The suggestions on quantitative testing are used as a reference to revise the product. Quantitative Testing results in two responses which are students' and teacher's responses conducted on May 16th and 17th 2018.

a. Data of students' responses toward Buku IPA Beriendela

The distribution of questionnaires was done through 19 students of SMP and MTs Nurul Muchlishin. The data gained in the second trial is the students' responses by giving them questionnaires. It contains 12 Yes/No questions with Yes (1) and No (0). The data of students' responses can be seen in Figure 1.

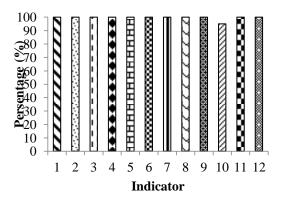


Figure 1. Questionnaire of Students' responses

Figure 1 shows those students' responses in the percentage of each indicator in the students' responses questionnaire. The highest percentage is 100% with a very good category and the lowest percentage of is the 10th indicator with a percentage

of 94.74%. It belongs to a very good category (Korniawati, Kusumo, & Susilaningsih, 2016). *Buku IPA Berjendela* contains instruction of learning activities and how to use the book clearly, attracts attention, attractive design /look, clear and readable font, many pictures which are match with the material, and communicative language used.

b. Data on the teacher's responses toward Buku IPA Berjendela.

The teacher's response is also needed to find out whether the product is decent or not. The result of the teacher's response gained by giving teacher's response questionnaire about the product. The questionnaire consists of 13 Yes/No questions with Yes (1) and No (0). The questionnaire toward the trial product was given to a science teacher of grade VIII at SMP and MTs Nurul Muchlishin. The result of the questionnaire shows 100% with very good category-based (Korniawati et al., 2016). The data of the teacher's response can be seen in Figure 2.

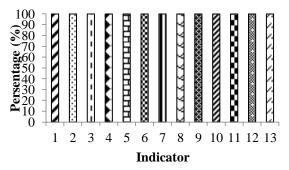


Figure 2. Questionnaire of Teacher's Response

Figure 2 shows the teacher's response toward *Buku IPA Berjendela*. Every indicator gained a high percentage of 100% with very good or very valid categories without any revisions.

Students' responses toward *Buku IPA Berjendela* are 99.56% while the teacher's response is 100%. This percentage shows that the eighth graders of SMP and MTs Nurul Muchlishin respond well toward *Buku IPA Berjendela*. Positive responses given by the teacher and students are because of many pictures in the book, some activities to open and close in some pages, photos of students' activities, colorful and different teaching materials with the students' Islamic boarding schools. The use of pictures in learning can stimulate students' interest and attention (Barroh et al., 2012).

The look of the product in terms of coloring got a positive response as indicated by an attractive look, color combination, and the placement of pictures. The color combination used in *Buku IPA Berjendela* is important. However, when the readers see the color of the product, it will make the book has a beautiful look because basically color can be used as a tool to express one's emotional feeling (Yogananti, 2015). The colors used in this study are

many colors combination aimed to influence students to be better in remembering the words and pictures. According to (Olurinola & Tayo, 2015), color can influence how to see and process one's information so that it can improve the ability to remembering words and pictures.

The language style used in the product is adjusted to the language style of students is SMP/MTs/. Therefore, it can be easy to be understood when students want to study autonomously. The language used of *Buku IPA Berjendela* is in accordance with Ejaan Bahasa Indonesia (EBI), but it is still in accordance with science learning and easy to be understood. The sentences of the product must be communicative so that students can understand what is conveyed in the material. Sentences which are easily understood are derived from clear ideas. Therefore, communicative sentences will be clear if the ideas are made and arranged in accordance with the right pattern (Riswari, 2012).

In the beginning, the use of language in the product needs to be validated in order to be a language that is easy to be understood. As the first implementation, the researcher did it for 6 graders of elementary school. It is supported by students' responses who stated that the language used is communicative. It will make students easier to understand the material. Constructivism theory explains that learning is a process of building knowledge by students. Therefore, by using the product, students are expected can learn it autonomously since one's knowledge cannot be transferred simply from the teacher to students (Siregar & Nara, 2014).

The concept or material in *Buku IPA Berjendela* includes five chapters. They are (1) Gaya; (2) energi dan usaha; (3) tekanan; (4) getaran dan gelombang; and (5) cahaya dan alat optik. These are presented with the concepts from ease toward difficulty. A sequential or systematic concept can help students to understand more the material or information. The concept explained in order starts from ease, then continues to the difficulty or from the concrete to the abstract (Agustina, 2015).

The material in *Buku IPA Berjendela* is more compact. Yet, it can help students understand the information better. This is in accordance with the statement of (Afifah & Susilowibowo, 2016) which states that flap book can help students in summarizing material or concept in the science learning context. The material is presented based on the topic and reality in order to improve student understanding easily. This is in accordance with Bronfenbrenner's learning theory which is also called as the ecological theory. This theory emphasizes on the social context in which students live (student's ecology), the product is adjusted to microsystem (the environment in which students

spend the most time), it is Islamic boarding school environment (Santrock, 2010).

The product is in the form of windowed teaching material which is expected to be able to train creative thinking skill by using a window (flap) in every material that has characteristics of explained material or pictures that can be opened or closed like a window. in Gaya material in Buku IPA Berjendela has some pictures that can be opened like a window. Thus, in the hidden part behind the picture, there is an explanation about the picture in front of it. The hidden part in Buku IPA Berjendela can increase student's curiosity. Student's curiosity is one of the characteristics of creative thinking skill. (Palasari, 2014) states that students' creative thinking skill will not arise accidentally, but it needs preparation such as giving stimuli during the learning process and being ready for the teaching material. Instead of having a window (flap) to increase students' curiosity, Buku IPA Berjendela also has creative thinking skill aspect such as flexibility, originality, detailing, and fluency (Palasari, 2014).

Flexible (flexible thinking) is a student's ability to produce various answers or ideas and see by considering many different perspectives. The aspect of flexible thinking ability can be found in the feature "Ayo Berfikir". It can be found in all material in the book. It also belongs to an aspect of original thinking skill which is defined as student's skill in having solutions which are different from others and it is not commonly used as in the material "tekanan". Students are required to solve an unusual problem as in the material "tekanan". That is the use of two straws but one straw does not be bound with the drink.

The third aspect is detailing (elaborating). It is a student's ability to elaborate/detail an idea. This aspect is found in the feature "Tahukah kamu" as in the material "gaya". Students can know that the weight in the moon and earth are different but the mass between the earth and the moon is the same. The fourth aspect is fluency. In this ability, students are able to provide many ways to solve the problem by using the appropriate strategy and thinking for it fluently. Thinking fluently in *Buku IPA Berjendela* occurs in the questions in it. Students need to find other ways to answer the questions.

The aspect of creative thinking skill in *Buku IPA Berjendela* can be found in the feature "ayo berfikir", "tahukah kamu", and "some questions". Moreover, the book also has a window (flap). Students' creative thinking skill is needed in science learning to solve a problem. According to (Rahayuni, 2016) one of the outcomes in science learning is creative thinking skill. Thus, the material in *Buku IPA Berjendela* can be used as a secondary teaching material to train students' creative thinking skill.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the result, it can be concluded that the advisability of *Buku IPA Berjendela* in content material validation, format validation, and look validation belongs to the category of very decent. The response of teacher and students toward Buku IPA Berjendela gives a positive response to the excellent category.

There are some suggestions that need to be considered for further research, as follows:

- a. There is a specific limit for picture toward *Buku IPA Berjendela*.
- b. The pictures in *Buku IPA Berjendela* are hand-drawing.
- c. The flow of reading *Buku IPA Berjendela* is focused on the instructions for Standard Competence (SK), Basic Competence (KD) and learning objectives at the beginning of each chapter.
- d. The response is done by using the Likert scale.
- e. The instrument of creative thinking skill is needed to know a percentage of of the improvement in students' creative thinking skill.
- f. There is a limit of the picture toward *Buku IPA Berjendela*.

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