

Research Article

Development of Book Creator-Based Teaching Materials for Water Cycle Learning at Keude Bieng Elementary School, Aceh Besar

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ABSTRACT

Teaching materials are an important component in learning in schools. Based on the results of interviews with the principal and fifth grade teachers of Keude Bieng Elementary School, Aceh Besar, it was found that the material presented in the textbooks was not complete enough, so that students found it difficult to understand the water cycle material. One effort is to develop teaching materials based on interesting and appropriate book creators. The purpose of this study is to produce valid, practical, and effective products. This study uses the Research and Development (R&D) method with the ADDIE development model. The instruments used were validation sheets, response questionnaires, observations and tests. The subjects in this study included 40 fifth grade students of Keude Bieng Elementary School, Aceh Besar. The results of this study are as follows. 1) The results of the validation of material and media experts obtained an average of 95%. 2) The results of small-scale tests of observations of student activities and student responses averaged 93.55%. And the results of large-scale test data of observations of student activities and student responses averaged 96.72%. 3) Effectiveness data was obtained from student learning outcomes, as many as 100% of students got a KKM pass score. Thus, it can be concluded that book creator-based teaching materials for water cycle learning are declared valid, practical and effective to be used as learning resources.

Keywords: Development; Teaching Materials; Book Creator; Water Cycle

1. INTRODUCTION

Along with the development of the times, Science and Technology continue to experience great changes. Science is very easy to use anywhere and anytime and can affect areas of life, one of which is the field of education. The quality of education can be improved by making updates such as teaching materials, curriculum, learning media, learning innovations and educational facilities and infrastructure. Education is expected to create individuals who are skilled in certain disciplines, namely by studying the development of science and technology. Education involves the learning process as a form of communication produced or carried out by teachers with students who are present in the learning and teaching procedures. Several components that can help various learning activities are very necessary to create innovative and enjoyable learning.

Learning activities can be supported by the existence of teaching modules or teaching materials that are appropriate for students. Teaching materials are expected to make it easier for students to understand the learning material. Teaching materials that can give an interesting impression to students will arouse students' motivation and desire to study the teaching material (Yunarto et al., 2021). The achievement of learning competencies can be successful depending on several aspects. The aspect that can influence this success is how a teacher can create creative, interesting, and innovative teaching materials during the implementation of learning. Teaching materials are a collection of learning resources in accordance with the applicable curriculum and can help teachers to deliver material during the learning process (Magdalena et al., 2020). The learning process in schools is greatly assisted by the existence of teaching materials.

Science is a learning that is very closely related to the surrounding environment, so that it can provide scientific and real insight to students. According to Susanto (2014:167), science is a human effort to understand the universe through observation, use of methods and explanations through reasoning to arrive at a conclusion. The material in science learning is less challenging for students and many students have difficulty understanding and mastering science material,

especially water cycle material. So the use of technology is needed to support this learning. The implementation of science learning must be carried out in a conducive atmosphere, meaning that the learning activities carried out must be active, effective, and also fun (Hukama, Muhifbatul, Laihat, 2017). Management of science teaching materials is an important aspect to achieve a learning goal. Good and appropriate teaching materials are needed by students. In order for students to understand the material and achieve science goals, a teacher must be able to utilize technology to develop innovative, creative, and interesting teaching materials and packaged systematically that can be studied anywhere and anytime. With this opportunity, teachers can improve the quality of their learning.

The results of the researcher's initial observations and interviews with the fifth grade teacher of Keude Bieng Elementary School, Aceh Besar, showed that the school had provided textbooks for students. However, according to the class teacher, the material presented in the textbooks was incomplete, so students found it difficult to understand the material, especially the water cycle material. Based on information obtained from the teacher, none of them had developed book creator-based teaching materials. Teachers use teaching materials in the form of books but they are not yet digital-based. So that improvements and innovations are needed to develop digital teaching materials that can be accessed via smartphones, computers, and laptops. The reason teachers do not develop book creator-based teaching materials is because of time constraints and lack of knowledge and skills in using technology.

Based on these problems to help students understand the water cycle material and encourage student motivation during learning, researchers are interested in developing electronic teaching materials in the form of e-books based on book creators that are innovative and also interesting and can arouse students' desires during the learning process. Researchers will develop teaching materials that can support learning of water cycle material. The teaching materials are based on book creators. According to Widodo & Jasmadi in Lestari (2013:1), teaching materials are a set or learning tool that contains learning materials, learning methods, methods, limitations, and evaluation methods that are designed systematically and attractively in order to achieve the expected goals, namely achieving competencies or sub-competencies with all their complexities. Book creator is an application consisting of text, images, or sound and is published in digital form that can be read on computers or other electronic devices such as Android, smartphones, or tablets (Nasrul Makdis, 2020). Teaching materials will be converted into book creators equipped with images, audio, and videos. With the existence of teaching materials based on book creators, it can help students understand the material and learn independently anywhere and anytime.

Previous research results by Sanjaya (2022) stated that Book Creator is a platform used to create interactive digital books that are interesting and rich in multimedia content. Digital-based teaching materials are one solution that suits the character of Gen Z students. In the water cycle material, innovative and interesting book creator-based teaching materials will be developed using existing features such as inserting images, audio and video and containing complete and systematic materials. Thus, students do not get bored while studying so that the material they study is easy to understand. Book creator-based teaching materials are expected to increase student interest and activeness during science learning. Based on the explanation that has been explained, the researcher wants to develop book creator-based teaching materials regarding "Development of Book Creator-Based Teaching Materials for Water Cycle Learning in Class V of Keude Bieng Elementary School, Aceh Besar".

2. RESEARCH METHOD

This study uses the Research and Development model. According to Sugiyono (2021:395), Research and Development is a study to be able to produce and test the effectiveness of a product. This study uses the ADDIE development model. At the product development stage, the ADDIE model is considered more rational and complete (Mulyatiningsih, 2016). According to Rayanto and Sugianti (2020:33), the ADDIE model consists of five stages, namely Analyze, Design, Development, Implementation, and Evaluation. The flow of the ADDIE model stages is shown in the [Figure 1](#). (1) At the Analyze stage, the curriculum and student characteristics will be analyzed. At the (2) Design stage, the design planning is carried out according to the previous analysis. At this stage, the selection of products, formats, content, and also language is also carried out. (3) At the development stage, the design of teaching materials based on book creators is developed according to the design. This stage also validates the developed product. Validation is carried out by material experts and media experts. This material validation is used to determine the feasibility of the material contained in the teaching materials based on book creators that are developed. The assessment of material experts includes three aspects, namely the aspect of content feasibility, the aspect of grammar, and the aspect of presentation. Furthermore, the assessment by media experts aims to determine the feasibility of teaching materials based on book creators on the water cycle material as seen from the media design side. There are 3 aspects that are validated, namely the aspect of design appearance, completeness of material, and grammar. Furthermore, (4) the Implementation stage, after the teaching materials based on book creators have been

validated and declared valid by material and media experts. Furthermore, small-scale and large-scale trials are carried out to determine the practicality of a product. And (5) the evaluation stage consists of two, namely formative evaluation to meet the revision needs of the validator expert and summative evaluation to analyze the effectiveness of a product.

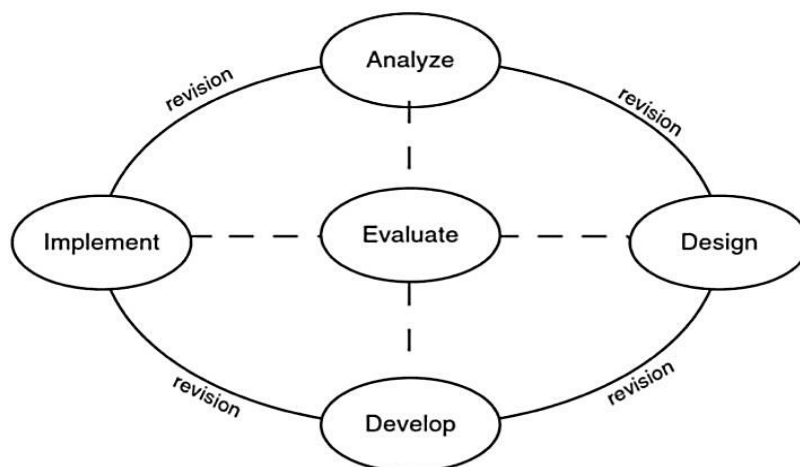


Figure 1. ADDIE Model Stages (Branch, 2009:2)

The subjects in this study were fifth grade students of Keude Bieng Elementary School, Aceh Besar. A total of 10 VA class students as a small-scale test and 30 VB class students as a large-scale test. The research instruments used were validation sheets of material experts and media experts, observation sheets of student activities, student response questionnaires, and learning outcomes. The data analysis technique in this study was carried out qualitatively. According to Nieveen and Folmer (2013), the assessment of the quality of a product includes aspects of validity, practicality and effectiveness. The product that has been developed is declared valid if it obtains an assessment by the validator with at least good criteria. Furthermore, the product is declared practical if the activities and responses of students are at least with good criteria. Then the product is declared effective if at least 85% of students or more can meet the minimum completeness criteria (KKM). The stages of data analysis techniques are carried out as follows:

Validity of Book Creator Based Teaching Materials

Validity is analyzed based on the validators' assessment of the content, format and language of the developed product. The validator will give a score for each item assessed using a Likert scale. Determination of assessment criteria by calculating the average score for aspects that have been assessed with the equation based on Riduwan (2015:15) as follows:

$$\text{Value} = \frac{\text{the number of scores obtained}}{\text{maximum score}} \times 100 \%$$

The percentage of validity eligibility according to the assessment criteria is as follows:

Table 1. Criteria for Assessing the Validity of Book Creator-Based Teaching Materials

Percentage (%)	Criteria
81%-100%	Very Good
61%-80%	Good
41%-60%	Enough
21%-40%	Not Enough
0%-20%	Not Good

Source: (Riduwan , 2015:15)

Practicality of Book Creator-Based Teaching Materials

Practicality is analyzed based on student activities during learning and student responses. To calculate the questionnaire responses and student activities, the percentage value formula based on Riduwan (2015:15) is used as follows:

$$\text{Value} = \frac{\text{the number of scores obtained}}{\text{maximum score}} \times 100 \%$$

To determine the practicality of book creator-based teaching materials, the following assessment criteria must be met:

Table 2. Practicality Criteria for Book Creator-Based Teaching Materials

Percentage (%)	Criteria
81%-100%	Very Good
61%-80%	Good
41%-60%	Enough
21%-40%	Not Enough
0%-20%	Not Good

Source: (Riduwan (in Fadhlurrohman et al., 2020)

Effectiveness of Book Creator Based Teaching Materials

Effectiveness is analyzed based on student learning outcomes. Student learning completion if they get a minimum score of 75 according to the minimum completion criteria (KKM). Book creator-based teaching materials for water cycle learning are declared effective if at least 85% of students or more can achieve the KKM score completion achievement (Faridah & Afridiani, 2021).

3. RESULTS AND DISCUSSION

3.1 Analysis stage

At this stage, an analysis of the school curriculum and student characteristics was carried out. Based on a joint analysis by the principal and class V teachers of Keude Bieng Elementary School, Aceh Besar, the curriculum applied in class V is an independent curriculum. Thus, it can be seen the competencies to be achieved in science learning and the accuracy of the material to be developed. Furthermore, the results of the analysis of student characteristics show that students really need interesting electronic teaching materials in order to learn the water cycle material. So far, student learning outcomes have not reached the minimum completion criteria and students are less challenged and interested in science learning. As stated by (Awang, 2016), students are less interested in learning science because the concepts presented contain too many foreign terms, the material is too broad, and students tend to memorize and abstract concepts. Thus, interesting and innovative electronic teaching materials are needed that also help students understand abstract science concepts. Book creator-based teaching materials are one of the electronic teaching materials that can attract students' attention during the science learning process and also help students understand science material (Hadiyanti, 2021). Based on the results of the Analyze stage, electronic teaching materials will be developed in the form of book creator-based teaching materials for water cycle learning in grade V.

3.2 Design stage

This Book Creator-based Teaching Material was developed in accordance with the concept of water cycle material in grade V based on the applicable curriculum with various valid references. The materials contained in the book creator-based teaching material are shown in **Table 3**.

Table 3. Materials included in Book Creator-Based Teaching Materials

Number	Material
1	Understanding the Water Cycle
2	Stages of the Water Cycle
3	Benefits of Rain for Human
4	Benefits of Rain for Plants
5	Benefits of Rain for Animals

After compiling a collection of learning materials obtained according to the curriculum. Next, a search for interesting images is carried out through Canva according to the concept of the material. The Canva application can determine the size, theme, base color, font type, and so on. Nuryani and Surya Abadi's statement (2021), that book creator-based teaching materials must be designed by containing appropriate images, symbols and colors so that they can motivate and strengthen students' memories.

3.3 Development stage

Furthermore, the book creator-based teaching materials that have been designed will be developed according to the previous design, then converted into a flip (back and forth) form to insert audio and video. At this stage, product revisions are continuously carried out so that valid products will be obtained. As stated by Kosasih (2021), good teaching materials are those that have systematic knowledge, are in accordance with the curriculum and learning objectives and direct students to understand the material. The initial development of book creator-based teaching materials is as follows.

a) Cover of teaching materials based on book creator



Figure 2. Cover of book creator-based teaching materials

b) Content of teaching materials based on Book Creator



Figure 3. Contents of Book Creator-based teaching materials

c) Closing of teaching materials based on Book Creator

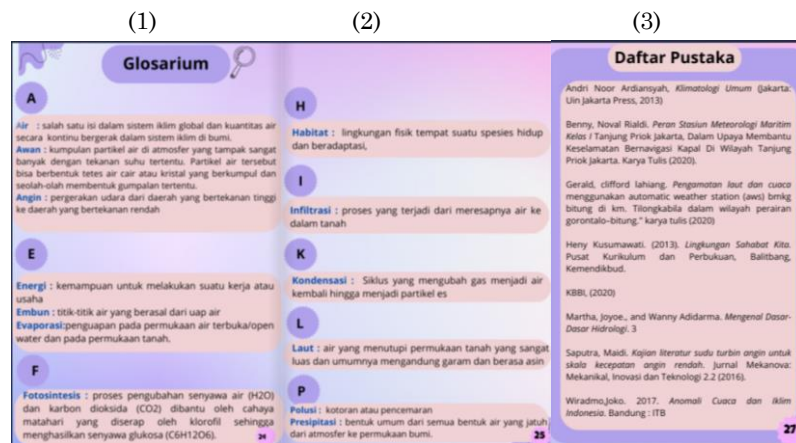


Figure 4. Closing of Book Creator-based teaching materials

The developed book creator-based teaching materials will then be validated by material experts and media experts. This material validation is used to determine the feasibility of the material presented. The assessment by material experts includes three aspects, namely the feasibility of content, grammar, and presentation aspects. Furthermore, the assessment by media experts aims to determine the feasibility seen from the media design side. There are 3 aspects that are validated, namely the design appearance aspect, completeness of the material, and grammar. The results of the assessment by material experts and media experts are shown in **Table 4**.

Table 4. Results of Validation by Material Experts and Media Experts

Validators	Value obtained
Subject Matter Expert	96,92%
Media Expert	92,85%
Average	95%

Based on **Table 4**, the results of the validation by material experts obtained a value of 96.92%, and the results of the validation by media experts obtained a value of 92.85%. Thus, the total assessment of material and media experts obtained an average value of 95% with very good criteria. Therefore, book creator-based teaching materials are declared to meet the validity criteria. The attractive appearance of book creator-based teaching materials is expected to motivate students and provide a learning experience so that the learning process is more active (Putra et al., 2017). The final results of book creator-based teaching materials will be published in the form of a web link <https://bit.ly/bukuajaripa>.

3.4 Implementation stage

Book creator-based teaching materials that have been validated and declared valid by material and media experts. Furthermore, at this stage, a trial was conducted on the research subjects, namely by implementing learning. First, a small-scale trial was conducted with 10 students in class VA of Keude Bieng Elementary School, Aceh Besar. Data from observations of student activities and student responses to the products developed will be collected in this small-scale test. The results obtained can be displayed in **Table 5**.

Table 5. Small Scale Trial Results

Aspect	Assessment Results	Value Category
Student Activity Observation	91,42%	Very good
Student Response	95,69%	Very good
Average	93,55%	Very good

Based on **Table 5**, the results of observations of student activities during the learning process using book creator-based teaching materials obtained a score of 91.42% and student responses to ease of use obtained a score of 95.69% and if averaged, it obtained a score of 93.55% with a very good category. After getting very good results in small-scale trials, a large-scale test will be carried out on 30 VB class students at Keude Bieng Elementary School, Aceh Besar. During the large-scale trial learning process using book creator-based teaching materials, student activities are the same as small-scale trial activities. The things observed include student seriousness, operation, and student interaction. After the learning activities are completed, students will then provide their responses to the design appearance, ease of use, and the benefits they feel from book creator-based teaching materials. The results are shown in **Table 6**.

Table 6. Results of Large-Scale Trials

Aspect	Assessment Results	Value Category
Student Activity Observation	97,14%	Very good
Student Response	96,30%	Very good
Average	96,72%	Very good

Based on table 6, the results of the large-scale trial show that the observation of student activity obtained a score of 97.14% and student responses obtained a score of 96.30%, if averaged, the percentage score of 96.72% is classified as very good. Thus, book creator-based teaching materials meet the criteria for practicality. The results of this study are in line with the results of research by Salma, et al. (2023) which revealed that book creator-based teaching materials meet practical criteria and can motivate students during the learning process. Furthermore, it is reinforced by the results of Hadiyanti's research (2021) which states that based on the results of student responses and activities, book creator-based teaching materials get very good criteria and can motivate students to learn, attract students' interest, and help students

understand the material being studied.

3.5 Evaluation stage

The evaluation stage has two types, namely formative evaluation and summative evaluation. This formative evaluation stage usually occurs in one of the four stages above, because its purpose is as a revision need. The summative evaluation is carried out at the end of learning to measure the abilities of students. The following are the results of the formative evaluation by material and media experts:

a. Summarizing a long reading

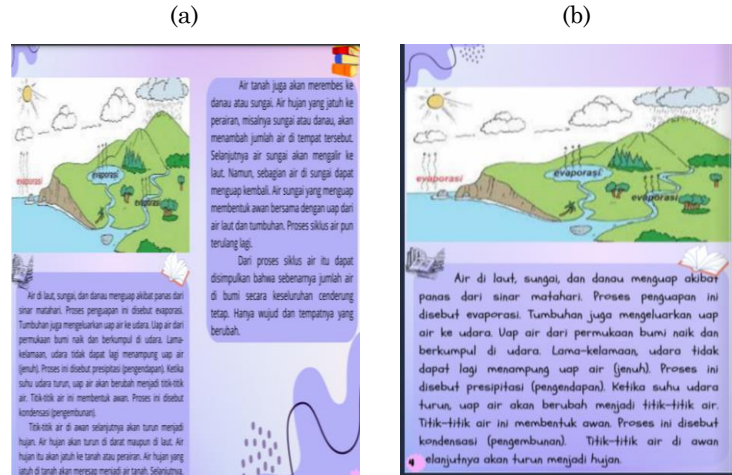


Figure 5. Correcting Reading Text
(a) Before Revision, (b) After Revision

b. Change the font of the text

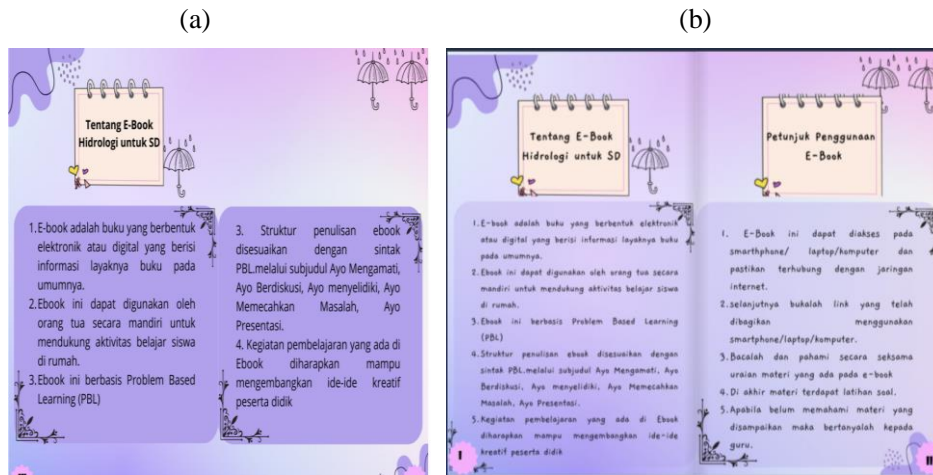


Figure 6. Changing the font of the text
(a) Before Revision, (b) After Revision

Furthermore, summative evaluation is conducted to measure students' abilities. After the learning activities are completed, students will be given a learning outcome test in the form of questions on the human respiratory system. This evaluation will analyze the effectiveness of book creator-based teaching materials for water cycle learning. The learning outcomes can be seen in the following Table 7.

Table 7. Learning Outcome Test

Test	Average Score	Percentage of Completion
Small Scale Trial	93	100%
Uji Coba Skala Luas	96,33	100%

Based on the Table 7, the data of the small-scale student learning outcome test has been obtained which obtained an average score of 93 with 100% learning completion. Furthermore, the large-scale trial obtained an average score of 96.33

with 100% completion achievement. Based on the learning outcome test, it shows that book creator-based teaching materials for water cycle learning meet the effectiveness criteria. The results of this study indicate that learning using book creator-based teaching materials for water cycle learning can achieve a minimum completion value. The results of this study are in line with (Yulaika et al., 2020) stating that students can understand the material contained in book creator-based teaching materials, because there are supporting features in it so that student learning outcomes increase. Strengthened by research by Ningtyas et al., (2020) explaining that book creator-based teaching materials that were developed were declared effective based on student learning outcomes that passed the KKM value, so that book creator-based teaching materials were effective and included in the very good category. Several theories and research results by Awwaliyah et al., (2021), explain that book creator-based teaching materials are useful for teachers and students as teaching materials that can facilitate learning activities. This is because it has presented material containing images, videos, and questions that can motivate students to learn anywhere and anytime.

4. CONCLUSION

The product developed is a book creator-based teaching material for water cycle learning, which contains a collection of materials, images, videos and other animations so that it can attract students' attention. The product was developed in five stages, namely Analyze, Design, Development, Implementation, and Evaluation. The quality of a product is reviewed from validity, practicality, and effectiveness. The results of this study indicate that the results of the validation of material and media experts get an average score of 95% with a very good category. So the book creator-based teaching material is declared to have met the validity criteria. Furthermore, the results of observations of student activities during the learning process and student responses to small-scale tests get an average score of 93.55%, classified as very good. And the results of observations of student activities and student responses to large-scale tests get an average score of 96.72%, classified as very good. Thus, book creator-based teaching materials meet the criteria for practicality. Furthermore, the learning outcomes of students after the learning process using book creator-based teaching materials for water cycle learning in small-scale tests obtained an average score of 93 and large-scale tests obtained an average score of 96.33 with a completion rate of 100%. Therefore, book creator-based teaching materials are declared to meet the effective criteria. Book creator-based teaching materials for water cycle learning meet the criteria of being valid, practical and also effective to be used as a learning resource for grade V students.

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