

Development of Pop Up Books for Thematic Learning of the Sub-theme of Changes in the Form of Objects

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Abstract

Limited media facilities and infrastructure for technology-based media in schools require teachers to use print-based media. Students have difficulty understanding thematic learning because of the limitations of interactive media. This research aims to develop pop up book media for thematic learning on the sub-theme of changing the shape of objects that is suitable for use. This research design uses the Borg n Gall's development type up to the evaluation stage. The results of the material expert assessment obtained a percentage of 91.4% with a very feasible category. The results of linguist's assessment got 83.4% categorized feasible. The results of media expert's assessment get 95% it means feasible. Readability of student's test got a percentage of 100% with a very decent category. Student's can read and use pop up books. Readability of teacher's test got 100% with very feasible. So that's pop up book can help teachers in the learning process.

Keywords: *Pop-Up Book, Learning, Thematic*

1. INTRODUCTION

Education is a process aimed at creating high-quality human resources who are characterized, intelligent, skilled, creative, and dignified. This can be achieved through both formal and non-formal institutions, one of which is at the elementary school level (SD). The implementation of learning at SD involves teachers and students. Effective learning requires efficient, organized, and structured coordination to achieve educational goals. Through an active, effective, innovative, and character-based learning process, it is hoped that students can develop their potential in terms of religious spirituality, self-control, personality, intelligence, noble character, and skills that are implemented in everyday life both in society and in the nation.

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The quality of learning depends on the planning carried out by teachers, the implementation of lesson plans in the classroom, and the evaluation conducted by the teachers. According to Daryanto (in Prasetyo, 2013:12), the quality of learning is a level of achievement of learning goals in the form of increased knowledge, skills, and the development of student attitudes through the classroom learning process. Good learning quality can be seen from the achievement of learning objectives. One of the supports for achieving quality learning goals is that teachers must be able to create learning innovations through teaching media that are appropriate to the students' characteristics. Learning media are expected to help and facilitate teachers in delivering material to students and to attract students' interest, talents, and enthusiasm in learning.

Based on interviews and observations at three schools, namely UPT SD Negeri Pagergunung 03, UPT SD Negeri Kesamben 04, and UPT SD Negeri Kesamben 02 with teachers and third-grade students in the even semester, it was found that the teachers' preparation for learning was in accordance with the RPP and syllabus. Learning media at UPT SD Negeri Kesamben 04 are limited to media using LCDs, and the number of class teachers so teachers have to take turns using the LCD. To overcome this problem, teachers took the initiative to use the experimental method, namely practical work. However, during the learning process, not all students could be active and enthusiastic. The learning resources used at UPT SD Negeri Pagergunung 03 and UPT SD Negeri Kesamben 02 use thematic textbooks for grade 3. Based on observations at these three schools, it was shown that students were less engaged in the learning process. This was indicated by students talking to their seatmates, joking during the learning process, and not paying attention to the teacher's explanation.

The challenge faced in the learning process is the lack of use of learning media, making student learning activities less attractive. This is shown during observations where students paid less attention to the teacher's explanation. Based on observations at the three schools, it was shown that there was a lack of student enthusiasm during the learning process. This was indicated by students talking to their seatmates, joking during the learning process, and not paying attention to the teacher's explanation.

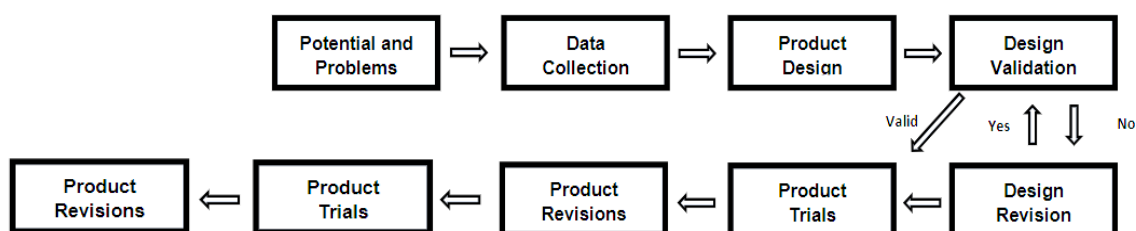
The needs analysis questionnaire distributed to all third-grade students at the three schools showed that 40 students were less enthusiastic about participating in learning because there was no interesting media, making them feel bored and not interested in listening to the teacher's explanation. This is shown from the results of the students' needs analysis questionnaire, which indicated that 70% of students agreed that the learning media used in schools were not able to facilitate students, resulting in students' attention to the material being divided. Based on these problems, interactive media that is not limited to technology is needed to complement textbooks as teaching materials. The researcher seeks to develop pop-up book learning media on the sub-theme of changes in the state of matter because this media is interesting and suitable for this sub-theme, but is still rarely known by elementary school teachers.

A pop-up book is a three-dimensional interactive book. According to Dzuanda (2011:1), a pop-up book is a book that features three-dimensional elements and interaction, providing interactive visualization that can move when opened as if an object is emerging from each page. Students will experience an engaging learning experience such as sliding, opening, and even folding the contents of the pop-up book, making this media a standout feature of the pop-up book. Through such learning activities, students will be more active, enthusiastic, and motivated to participate in learning.

The development of pop-up book learning media on the sub-theme of changes in the state of matter for third-grade elementary students is expected to facilitate teachers in delivering learning materials and increase students' enthusiasm and motivation to learn. Thus, the teaching and learning activities can proceed in accordance with the expected learning objectives. Therefore, this development research is titled "Development of Pop-Up Book Media on the Sub-Theme of Changes in the State of Matter.

2. RESEARCH METHOD

This pop-up book media research uses the Research and Development (R&D) method with a quantitative approach. This research and development follow the model proposed by Sugiyono (2012), which consists of 10 stages to produce a product. These stages include potential and problem identification, data collection, product design, design validation, design revision, product testing, product revision, usagetrial, product revision, and mass production. The steps in this research are limited to the ninth stage. The research and development procedure can be seen in the following chart



(Source: Sugiyono)

Figure 1. Research Method Stages

The subjects of this research are 15 third-grade students and a teacher at UPT SD Negeri Kesamben 04. Data collection techniques use questionnaires. Data analysis techniques use descriptive quantitative and qualitative methods. The subjects in this research were involved in the readability test stage. Data collection in this research was conducted using interviews, observations, and questionnaires. Interviews were conducted during initial data collection and readability testing. Questionnaires were used during validation and readability testing.

The data analysis technique in this research is descriptive qualitative and quantitative analysis. Data from questionnaires from three experts, namely material experts, media experts, and language experts, and assessments from teachers are analyzed using a scale of 5. Data from student assessments are analyzed using a scale of 1. The formula used for the feasibility assessment is as follows:

$$\text{Average Score} = \frac{\text{Obtained Score}}{\text{Ideal Score}} \times 100$$

Table 1. Qualification Based on Average Percentage

| Achievement Level | Validity Level | Information |
|-------------------|----------------|-------------|
| 90 – 100% | Very Worthy | Not Revised |
| 75 – 89% | Worthy | Not Revised |
| 65 – 74 % | Decent Enough | Revision |
| 55 – 64 % | Not Worth It | Revision |
| 0 – 54% | Not Feasible | Revision |

Table 2. Student Response Questionnaire Assessment Indicators

| Number | Criteria | Positive | Negative |
|--------|----------|----------|----------|
| 1 | Yes | 1 | 0 |
| 2 | Not | 0 | 1 |

Table 3. Product Feasibility Level Qualification from Student Readability Results

| Achievement Level | Validity Level | Information |
|-------------------|----------------|-------------|
| 90 – 100% | Very Worthy | Not Revised |
| 75 – 89% | Worthy | Not Revised |
| 65 – 74 % | Decent Enough | Revision |
| 55 – 64 % | Not Worth It | Revision |
| 0 – 54% | Not Feasible | Revision |

3. RESULT AND DISCUSSION

Based on the initial needs analysis conducted by the researcher at three schools, namely UPT SD Negeri Pagergunung 03, UPT SD Negeri Kesamben 04, and UPT SD Negeri Kesamben 02, through interviews, observations, and questionnaire distribution, it was found that teachers did not fully utilize teaching media for the subject of Changes in the State of Matter. During the lessons, teachers only used Thematic Books without supplementary media. Students also showed a lack of interest in learning when teachers explained the material, due to the absence of tangible media that could help them understand the subject matter. Based on these findings, the researcher initiated the creation of a new innovation to support the learning process for the topic of Changes in the State of Matter. This interactive medium is a 3D Pop-Up Book. Apart of that, opinion of Ida Putriani (2017:64), apply learning in a variety of ways a fun method or technique and use learning media It's fun to create a classroom that is active and effective.

The outcome of this media development is a 3D pop-up book. The pop-up book includes usage instructions, basic competencies, material, learning videos, quizzes, answer keys, and discussions. The pop-up book measures 21 cm x 29.7 cm. This media was developed to match the students' thinking levels, in accordance with Burhanuddin (2009), who stated that educational media should be aligned with the learners' cognitive

levels so that the embedded meaning can be easily understood by the students. Below is an illustration of the pop-up book developed by the researcher:



Figure 2. Pop-Up Book Design

The material validator indicated that the content feasibility is categorized as appropriate with a percentage of 91.4%. This percentage was obtained from various aspects within the questionnaire, especially points (1) the relevance of the content, (2) completeness and accuracy of the material, and (3) the coherence of the material arrangement. This aligns with the characteristics of thematic learning, which centers on active student engagement in learning concepts from the taught material. As per Majid (2014), thematic learning is characterized by holistic, meaningful, authentic, and active principles. Additionally, the media created matches the characteristics of a pop-up book according to Wahono (2009) in terms of the completeness of the presented material.

The material validation also indicated the linguistic feasibility, stating that the pop-up book adheres to linguistic rules, suits student development, and uses language that is easy to understand. Based on assessments by three language validators, the pop-up book is categorized as appropriate with a percentage of 83.4%. This percentage resulted from aspects within the questionnaire, especially points (1) readability of the text, (2) linguistic rules and accuracy of punctuation, and (3) use of communicative language that is easily understood by students. This indicates that the language validation results show that the media created matches the characteristics of a pop-up book according to Wahono (2009) in terms of visual communication, which includes the communicative level and the visual presentation related to language use.

Regarding feasibility, the media validator stated that the pop-up book is appropriate in terms of media design and visual appearance. Based on assessments by three media validators, the pop-up book is categorized as highly appropriate with a percentage of 95%. This is mainly reflected in points (1) the design of the pop-up book suitable for learning, and (2) the visual design of the pop-up book in terms of attractive images and colors. This aligns with Burhanuddin (2009), who stated that visual media plays a crucial role in visual design presentation, whether in terms of images, graphics, or colors, to enhance memory retention and illustrate concepts. These results correspond to the characteristics of a pop-up book according to Wahono (2009) in terms of visual communication, which includes the level of visual creativity that pertains to the pop-up book's presentation. Below is the percentage graph of the validation results from the three experts, presented in a bar chart:

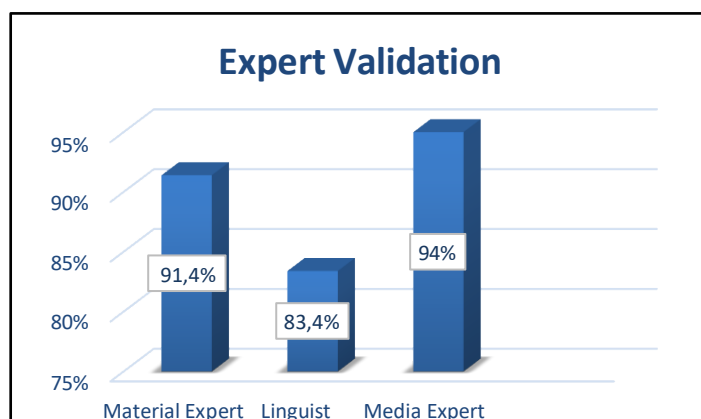


Figure 3. Bar Chart Table

Based on the assessments provided by the validators who determined the quality of the media developed by the researcher, the media received a percentage >80%, indicating that the media is feasible to be tested in the next stage to measure its readability.

In the next stage, the researcher conducted a limited trial of the Pop-Up Book at SD Negeri Kesamben 04 with the research subjects being teachers and third-grade students. The purpose of the limited product trial was to measure the readability of the developed media. The readability results obtained from the teachers are as follows:

Table 4. Readability Test Results by Teachers

| Num. | Question Details | Teacher 1 | Teacher 2 | Teacher 3 | Amount |
|----------------------|--|-------------|-----------|-----------|--------|
| 1. | The illustrations in the pop up book display reflect the material content of changes in the form of objects. | 5 | 5 | 5 | 15 |
| 2. | The color on the media is clear. | 5 | 5 | 5 | 15 |
| 3. | The choice of images on the media is clear. | 5 | 5 | 5 | 15 |
| 4. | The text size and font are easy to read. | 5 | 5 | 5 | 15 |
| 5. | The image illustrations on the media are clear. | 5 | 5 | 5 | 15 |
| 6. | The material is appropriate to the learning objectives. | 5 | 5 | 5 | 15 |
| 7. | The material on the media is clear. | 5 | 5 | 5 | 15 |
| 8. | Material is easy to read. | 5 | 5 | 5 | 15 |
| 9. | Sentences are easy to understand. | 5 | 5 | 5 | 15 |
| Total Score | | 135 | | | |
| Maximum Score | | 135 | | | |
| Presentation | | 100% | | | |

Based on the data obtained from Table 4.8, the readability questionnaire results from the teachers amounted to 135 out of a maximum score of 135, resulting in a percentage value of 100% from the maximum percentage value of 135%. Thus, the 100% value falls within the 90%-100% range and is categorized as highly feasible for use. Teachers commented that the media is very engaging, the material in the pop-up book is

easy to understand, and it greatly aids teachers in the learning process. Teachers also suggested that the pop-up book should include additional barcode codes in future developments and that it should be produced in multiple copies.

After conducting the readability test with teachers, the researcher also conducted a readability test with students. The results obtained are shown in the table below:

Table 5. Readability Test Results by Students

| Num | Indicator | Students | | | | | | | | | | | | | | | Total |
|----------------------|--|----------|---|---|---|---|---|---|---|---|----|----|----|----|----|-------------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| 1. | The pop up book display is clear and easy to understand. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 2. | The color combination of the pop up book is clear. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 3. | The illustrations in the pop up book are clear. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 4. | The type and letters on the pop up book are easy to read. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 5. | The sentences in the picture illustrations can be understand. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 6. | Pop up book media can be used easily. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 7. | The material in the pop up book media is easy to understand. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 8. | The basic competencies in the pop up book are clear and easy. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 9. | The learning in the pop up book is clear and easy to understand. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| 10. | The practice questions in the pop up book are clearly legible. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| Total Score | | | | | | | | | | | | | | | | 150 | |
| Maximum Score | | | | | | | | | | | | | | | | 150 | |
| Persentation | | | | | | | | | | | | | | | | 100% | |

Based on the data obtained from Table 4.8, the readability questionnaire results from the students amounted to 150 out of a maximum score of 150, resulting in a percentage value of 100% from the maximum percentage value of 100%. Thus, the 100% value falls within the 90%-100% range and is categorized as highly feasible for use.

The media that has undergone the trial phase will then move to the product evaluation stage. This evaluation stage is conducted to identify the strengths and weaknesses of the pop-up book development. The first product evaluation was conducted based on the validation process by validation experts, namely media experts, material

experts, and language experts. The second product evaluation was based on the readability tests conducted with 15 third-grade students and 3 teachers. The evaluation stage can be seen from the results of the questionnaire assessments by students and teachers after using the media.

Based on the validation and readability tests, the advantages of the pop-up book media that distinguish it from other media are as follows: (a) The media appearance is attractive, (b) The pop-up book is very enjoyable and not boring for students, (c) The material is easy to understand because it is accompanied by illustrative pictures and explanatory sentences, and (d) The language used is easy for students to understand. The weakness of the pop-up book, however, is the cost limitation for producing the pop-up book in large quantities.

4. CONCLUSION

Based on the results of research and development of the Pop Up Book for Thematic Learning Subtheme Change in Form of Objects for Class III elementary school students, it is suitable for use for student learning because it has gone through a validation process from various experts and trials with good results. Apart from that, the Pop Up Book for Thematic Learning Sub-theme Change in Form of Objects for Class III has an attractive appearance, comprehensive media content, is easy and effective to use in elementary schools, and can be used and utilized by a wide audience in carrying out the learning process.

5. SUGESTION

Suggestions for future researchers are that they can continue the research stages to instructional simulation and dissemination so that the Pop Up Book media can be used by the wider community.

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