

Development of Pop-Up Book Learning Media in Mathematics Subject on Plane Figures Material for Grade III at SD Negeri 064965 Medan.

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ABSTRACT

This study aims to: (1) determine how the Pop-Up Book learning media product is developed for the topic of plane figures, (2) determine the validity level of the media, and (3) determine the practicality level of the media. The method used in this study was the Research and Development (R&D) method. The development model applied in this research was the 4D development model consisting of four stages: (1) define, (2) design, (3) development, and (4) dissemination, introduced by Sivasailam Thiagarajan. This research produced a Pop-Up Book multiplication learning media for elementary schools. Based on the validation results of the learning media, the average scores were 91% from material experts, 93% from media experts, and 96% from language experts, indicating that the learning media met the "very feasible" criteria. The practicality results showed that the teacher response reached 92% and the student response reached 95%, indicating that the learning media met the "very practical" criteria. Based on these findings, it can be concluded that the Pop-Up Book learning media was declared highly feasible/valid and highly practical.

Keyword : Pop-Up Book Learning Media, 4D Learning Model, Students



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1. INTRODUCTION

The use of learning media in educational institutions refers to the standards of facilities and infrastructure as regulated in Government Regulation Number 19 of 2005 Article 1 paragraphs (1) and (8), which emphasize that educational standards are the minimum criteria of the national education system, including the utilization of facilities, infrastructure, and information and communication technology-based learning resources to support the learning process (Akbar, 2022). The existence of learning media is an important part of efforts to improve the quality of education through effective learning planning, implementation, and supervision.

Along with the development of technology and information, learning media are expected to improve the quality of the teaching and learning process as well as students' learning outcomes. However, in practice, the utilization of learning media in elementary schools is still not optimal. Many available learning media have not been used effectively, causing the learning process to become monotonous and less capable of increasing students' motivation and understanding. This condition has the potential to hinder the achievement of students' competencies comprehensively, especially in mathematics subjects which are abstract in nature.

A teacher is required to possess various professional competencies, one of which is the ability to use and develop learning media (Himayaturohmah, 2019). Learning media play an important role in creating active, interactive, and meaningful learning so that students can be directly involved in the learning process. However, in reality, many teachers still do not utilize proper and attractive learning media, especially in mathematics learning, resulting in students experiencing difficulties in understanding abstract concepts (Ulfa & Nasryah, 2020).

The problem of the low use of learning media is caused by limited access and teachers' lack of understanding of learning technology. Teachers tend to rely on textbooks as the only learning resource because they are considered practical, even though textbooks have limitations in presenting material and visualizing concepts. As a result, learning becomes less interesting and impacts students' low

learning motivation. In fact, the use of creative learning media can reduce teacher dominance, increase student participation, and deepen understanding of the material (Atmaja, 2020).

Based on observations and interviews conducted at SD Negeri 064965 Medan on December 20, 2024, with the third-grade teacher, information was obtained that the teacher was still limited in the use of learning media and only used picture media and textbooks in mathematics learning, especially on the topic of plane figures. Innovative learning media such as Pop-Up Books had never been used in the classroom learning process. This condition affected students' low learning motivation and the less optimal understanding of mathematical concepts.

One alternative learning media that can be used to overcome these problems is Pop-Up Book media. A Pop-Up Book is an interactive book that contains two-dimensional and three-dimensional elements with attractive visual displays through paper-folding techniques. This media is capable of presenting mathematical concepts concretely and visually, thereby helping students understand plane figure material more easily and enjoyably. In addition, the use of Pop-Up Books can help teachers deliver material more effectively and increase students' learning motivation.

Based on these problems, this study aims to develop Pop-Up Book learning media for mathematics subjects on the topic of plane figures for Grade III students at SD Negeri 064965 Medan. The development of this media is expected to become an innovative learning solution, improve learning motivation, and help students understand plane figure concepts more optimally. Therefore, this study is entitled "Development of Pop-Up Book Learning Media in Mathematics Subject on Plane Figures Material for Grade III at SD Negeri 064965 Medan."

2. RESEARCH METHOD

This study employed the Research and Development (R&D) method, which aims to develop and test the feasibility of Pop-Up Book learning media in Mathematics on the topic of plane figures for third-grade elementary school students. This method was chosen because it focuses on developing learning products that are effective and appropriate to students' needs.

The development design used in this study was the 4D model, which consists of the define, design, develop, and disseminate stages. The define stage was conducted to analyze learning needs and formulate learning objectives. The design stage aimed to design the Pop-Up Book media, while the develop stage included the product development process, validation by media experts, material experts, and language experts, as well as limited trials with students. The disseminate stage was carried out on a limited scale at the school where the research was conducted.

This research was conducted at SD Negeri 064965 Medan during the even semester of the 2024/2025 academic year, with research subjects consisting of expert validators, third-grade teachers, and 23 third-grade students. Data collection techniques used interviews and questionnaires. The data were analyzed using a Likert scale to determine the validity and practicality levels of the developed learning media.

3. RESULTS AND DISCUSSION

This study is a Research and Development (R&D) study aimed at producing Pop-Up Book learning media on the topic of plane figures for third-grade students at SD Negeri 064965 Medan. The developed product had gone through validation stages by material experts, media experts, and language experts to assess the feasibility of the content, appearance, and language aspects. The validation results showed that the Pop-Up Book media obtained a feasibility percentage of 91% in the material aspect, 93% in the media aspect, and 96% in the language aspect, all of which were categorized as highly valid. Therefore, the media was declared feasible for use without revision and could proceed to the limited trial stage.

A small group trial was conducted with six third-grade students to determine the practicality level of the media. The trial results showed that the Pop-Up Book media obtained a practicality percentage of 95%, which falls into the highly practical category. Students' responses indicated that the media was interesting, easy to use, and helpful in understanding the concept of plane figures. In addition, students appeared more active and enthusiastic during the learning process. The classroom teacher's response

also showed a very high practicality level with a percentage of 92%, indicating that the media was easy to implement in the learning process and did not require additional adjustments.

The developed Pop-Up Book media has advantages in its attractive visual design, the use of bright colors, and three-dimensional pop-up illustrations that are able to increase students' attention and learning interest. The material is presented systematically using simple and communicative language, making it suitable for the characteristics and cognitive development stage of elementary school students. This media also helps students understand plane figure concepts concretely, which were previously delivered abstractly through textbooks.

The development of this media used the 4D model, which includes the define, design, and development stages, while the dissemination stage was conducted on a limited scale due to time and resource limitations. At the define stage, a needs analysis was carried out through observations and interviews with teachers, which revealed that learning activities were still dominated by conventional media and had not yet utilized innovative media. The design stage focused on preparing the material and designing an attractive Pop-Up Book relevant to the curriculum. The development stage included expert validation and limited trials to ensure the feasibility and practicality of the media.

Based on the validation and practicality test results, it can be concluded that the developed Pop-Up Book learning media meets the criteria of being valid and highly practical. This media is not only feasible to be used as an alternative learning medium for Mathematics, but it is also capable of increasing students' activeness, motivation, and understanding of plane figure material. Therefore, the Pop-Up Book can serve as an innovative solution to support the Mathematics learning process in elementary schools.

4. CONCLUSION

This study is a Research and Development (R&D) study aimed at producing Pop-Up Book learning media on the topic of plane figures for third-grade students at SD Negeri 064965 Medan. The developed product had gone through validation stages by material experts, media experts, and language experts to assess the feasibility of the content, appearance, and language aspects. The validation results showed that the Pop-Up Book media obtained a feasibility percentage of 91% in the material aspect, 93% in the media aspect, and 96% in the language aspect, all of which were categorized as highly valid. Therefore, the media was declared feasible for use without revision and could proceed to the limited trial stage.

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