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## Development of Pop Up Book Media in IPAS Learning on Cultural Wealth Material for Grade IV Elementary School

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### ABSTRACT

This study aims to develop pop-up books as learning media for teaching cultural heritage material in IPAS to fourth-grade elementary students. The research was motivated by low student interest in learning and the limited availability of concrete media, which often causes boredom in class. The study employed the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) with data collected through interviews, observations, questionnaires, and documentation. Validation results showed that the developed pop-up book met feasibility standards. Subject matter expert validation reached an average of 95.5% (very feasible), while media expert validation after revision obtained 82.5% (very feasible). Teacher response was 96% and student response was 85%, both categorized as very good, with an overall average of 90.5%. Furthermore, evaluation tests involving 20 students demonstrated a high level of understanding of cultural heritage content, with most indicators scoring above 90% in correct answers. These findings indicate that the pop-up book is effective and practical, as it not only improves motivation and engagement but also supports deeper comprehension of IPAS material. Therefore, the developed media is considered appropriate for elementary school learning, particularly in enhancing students' critical and conceptual understanding of cultural diversity.

## 1. Introduction

Education is very important for the present and the future. With education, it will certainly shape a superior generation that is aware of the importance of knowledge, enhance problem-solving skills, and motivate learners to study. To achieve these educational goals, a curriculum is necessary, which consists of a set of plans and arrangements of objectives, content, and teaching materials, as well as methods used as guidelines for implementing learning. The teaching and learning process is the most crucial component of education, because the effectiveness of education rests heavily on how this activity is structured and carried out professionally (Sari, 2024). Law No. 20 of 2003 states that education aims to form individuals who are

intellectually intelligent, possess faith, have noble character, and are skilled according to the rules of the time.

The study of social sciences is an important subject in fulfilling national education, which has been taught from elementary school to higher education. However, many students consider social science learning to be a boring subject, due to a lack of basic understanding, unpleasant learning experiences, and low motivation in the learning process. Currently, the curriculum being implemented is the independent curriculum, which is still being tested on first and fourth grade students in elementary school. Natural and Social Sciences (IPAS) is the field of study that examines living organisms and inanimate objects in their surrounding environment along with their interactions (Rizqiyani et al., 2023). The key in this learning process is that the teacher has a role as a facilitator to assist students by providing various information, offering prompts or guidance when needed, and directing students to find answers (Sugih et al., 2023).

In the process of learning IPAS, teachers are required to modify various activities by adjusting to the conditions and needs of the students and the available facilities, using techniques and approaches to present information that interests the students, as well as to provide appreciation to the students (Junia and Sujana, 2023). To make the learning experience as effective as possible. Of course, teachers require learning technologies that can aid the learning process, and success can be reached through the use of learning media to make students more passionate about learning activities (Layyina et al., 2023). Learning media is important to be used as a means to facilitate the delivery of messages in the learning process and to achieve the learning objectives that have been set (Mafithroh and Wulandari, 2025). Therefore, learning media should be tailored to the concepts or materials being studied: the appropriate use of learning media can affect the quality of the learning process and the results achieved (Wartika and Prahasdito, 2018). Learning media not only serves as an aid but can also stimulate the motivation and interest of students in learning.

Based on the results of pre-research interviews with the homeroom teacher and fourth-grade students, it is known that interest in learning in IPAS lessons is still quite low. Students stated that they are less interested in IPAS learning. As a result, students tend to not pay attention during lessons when the teacher explains the material. Meanwhile, the same thing was also conveyed by the fourth-grade homeroom teacher, who often relies on lecture and assignment methods due to a lack of concrete learning media, causing students to become passive and less actively involved. In learning so that students tend to accept whatever is conveyed by the teacher. Looking at the pre-research interview above, teacher need to choose appropriate media so that learning does not only use learning media that can stimulate student's interest and motivation to learn, making the learning process enjoyable and not boring.

Various studies indicate that the interest in learning IPAS is still relatively low, caused by several factors such as a lack of understanding of basic concepts, uninteresting experiences, and low motivation (Fauziyah and Mulyani, 2024). This

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condition is exacerbated by conventional teaching methods that often rely solely on lectures and assignments, making students tend to be passive and quickly bored (Ilham et al., 2024). Traditional teaching methods often fail to attract student's interest, leading to poor understanding of natural science topics (Azzahra and Ninawati, 2024). The lack of interactive and visually appealing teaching materials also contributes to student's disinterest in learning (Putra and Witari, 2024). Therefore, to address these issues, teachers need to be more innovative in their teaching media, such as using pop up books.

A pop up book is a unique and interactive form of learning media that can bring scientific concepts to life and make them more accessible and engaging for learners (Noviyanti and Margunayasa, 2020). The three dimensional nature of a pop up book can create a more intensive learning experience, helping learners to better visualize and retain the information presented in an engaging way. Therefore, the development use of pop up book learning media for science and social science subjects in the fourth grade of elementary school can address significant educational challenges, including low engagement, understanding, and motivation among student's in learning (Riana and Pulungan, 2024).

Pop-up books are visually appealing medium that use folded and shaped paper to produce a three-dimensional impression, making the material more dynamic and easier learners to be more engaged in the learning process, therefore accelerating their knowledge of the concepts being taught (Nisrina and Prasetyaningtyas, 2025). The use of pop up book in learning has proven to be effective in increasing student interaction and helping them understand abstract concepts more concretely. Pop up books have advantages, including providing surprises on each page because they have dimensions that make images appear to pop out, and can be moved or shifted, giving a strong impression of the story, as their creation process requires more precision and a longer time (Sukmawarti, 2021). The disadvantages of pop up book are the production costs, which tend to be higher due to the lengthy creation process and the high risk of damage when used repeatedly (Mardiyah et al., 2022).

Natural and Social Sciences (IPAS) is a subject that studies living beings and inanimate objects in the universe, as well as the processes of interaction within it, including studying human life both individuals and as social beings interacting with their environment (Azzahra and Ninawati, 2024). The key in this learning process is that the teacher has a role as a facilitator in providing students with various types of information and offering prompts or guidance when needed. Several studies have shown that the use of visually appealing pop up book learning media can enhance students interest in learning (Putri et al., 2024). As demonstrated in the study Friska et al. (2023) titled "Development of pop up book media on cultural diversity material for fourth grade elementary school students". This study used a research and development approach with data collection techniques such as questionnaires, documentation, and interviews. The researchers and developers created a pop up book medium comprising the writers' own works on the IPS subject, with fourth grade kids serving as the research subjects. The study found that pop-up book medium is successful and appropriate for usage in primary school.

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The study conducted by Julianti et al. (2024) is based on the problem that the learning process regarding the content of Indonesian cultural riches displays a shortage of media employed in learning. As a result, students' motivation in studying is extremely low, and they rapidly become bored. As a result, the goal of this research is to create valid and useful pop up book learning material. Based on the identified research gaps, the primary goal of this study is to create feasible and practical learning media, with the problem being how appropriate it is and how students and teachers react to the developed pop up book media on the subject of cultural wealth.

Various studies indicate that the interest in learning IPAS is still relatively low, caused by several factors such as a lack of understanding of basic concepts, uninteresting experiences, and low motivation (Fauziyah and Mulyani, 2024). This condition is exacerbated by conventional teaching methods that often rely solely on lectures and assignments, making students tend to be passive and quickly bored (Ilham et al., 2024). Traditional teaching methods often fail to attract student's interest, leading to poor understanding of natural science topics (Azzahra and Ninawati, 2024). The lack of interactive and visually appealing teaching materials also contributes to student's disinterest in learning (Putra and Witari, 2024).

Therefore, to address these issues, teachers need to be more innovative in their teaching media, such as using pop up books. A pop up book is a unique and interactive form of learning media that can bring scientific concepts to life and make them more accessible and engaging for learners (Noviyanti and Margunayasa, 2020). The three dimensional nature of a pop up book can create a more intensive learning experience, helping learners to better visualize and retain the information presented in an engaging way. Therefore, the development use of pop up book learning media for science and social science subjects in the fourth grade of elementary school can address significant educational challenges, including low engagement, understanding, and motivation among student's in learning (Riana and Pulungan, 2024).

Pop up books are visually appealing media that use folded and shaped paper to create a three dimensional effect, making the material more alive and easier learners to be more engaged in the learning process, thus accelerating their understanding of the concepts being taught (Nisrina and Prasetyaningtyas, 2025). The use of pop up book in learning has proven to be effective in increasing student interaction and helping them understand abstract concepts more concretely. Pop up books have advantages, including providing surprises on each page because they have dimensions that make images appear to pop out, and can be moved or shifted, giving a strong impression of the story, as their creation process requires more precision and a longer time (Sukmawarti, 2021). The disadvantages of pop up book are the production costs, which tend to be higher due to the lengthy creation process and the high risk of damage when used repeatedly (Mardiyah et al., 2022).

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## 2. Methodology

This research is classified as development research, the purpose of development research is to pruced products that are feasible to use based on assessments from experts as well as responses from teachers and students (Saputra et al., 2024). The development model used is the ADDIE model. The ADDIE model is a systematic approach used to design and develop instructional programs that consist of five stages: Analysis, Design, Development and Evaluation. The data analysis technique used in this study includes both qualitative and quantitative data. Qualitative data is collected from interview and observation sheets, as well as suggestion and criticism sheets, and examined descriptively to determine media input and improvements. Interview and observation sheets are provided below. Meanwhile, quantitative data can be gathered using an assessment questionnaire using a four-point likert scale: very good, good, adequate, and poor. To examine the quantitative data, the percentage of each item score is calculated using the formula:

$$P = \frac{f}{n}$$

Description:

- P = feasibilty precentage
  - f = Total Number of answer
  - n = Highest total
-

Based on the obtained feasibility percentage score, the researchers then determined the product feasibility criteria as outlined in tables 1 and 2.

Table 1. Eligibility criteria

Interval Score	Criteria
$81\% < Y \leq 100\%$	Very worthy
$61\% < Y \leq 80\%$	worthy
$41\% < Y \leq 60\%$	Fairly worthy
$21\% < Y \leq 40\%$	Unworthy

Table 2. Criteria pop up book media based on the responses of teacher and students

Interval Score	Criteria
$81\% < Y \leq 100\%$	Very good
$61\% < Y \leq 80\%$	Good
$41\% < Y \leq 60\%$	Fairly good
$21\% < Y \leq 40\%$	Not good

### 3. Results and Discussion

#### *Result*

#### a. Analysis

In the analysis, the researcher identifies problems and analysis needs. During the analysis stage, the researcher conducts interviews with the fourth grade homeroom teacher to understand the conditions of the students and the learning conditions of IPAS. Based on the interview results with the teacher, it shows that so far, leaning, especially on the topic of cultural wealth, still relies on the lecture method and discussions with the student worksheets (LKS) as the only learning resource, resulting in students having difficulty fully understanding the material. The teacher also stated that the lack of learning resources and the absence of illustrations make the learning process less engaging, causing students to quickly become bored.

#### b. Design

At this stage, the pop up book is planned and designed based on the data obtained from the analysis stage. The design process is carried out by creating a storyline, and development is done through several stages as follow: (first) selecting cultural heritage materials in accordance with what has been taught for fourth grade, (second) designing a pop up book product model made from cardboard, (third) selecting illustrative images to attract student attention to the pop up book with design and shapes decorated with colors and interesting images. The initial design of the pop-up is as shown in Figure 1 below.



Figure 1. Initial Design of Pop-up Book

c. Development

Product validation occurs throughout the development stage through validation testing with a group of experienced professionals. The researcher consults with two content experts and two media experts who have been assigned to determine the strengths and shortcomings of the developed media. The validation procedure is intended to improve the media that has been developed. Figure 2 shows the results of the pop-up book product development.



Figure 2. Pop-Up Book Media Display

The validation process is carried out by providing the developed pop up book media to validators and giving them a validation sheet to be assessed based on predetermined assessment aspects. This validation aims to assess the feasibility of the material, integration with the cultural values, and suitability with student characteristics. The results of the material aspect. The results of material validation by expert validators can be seen in Table 3 below.

Table 3. Results of Material Validation

No.	Responden	Total Score	Presentage	Criteria
1.	Course lecturer	57	95%	Very worthy
2.	Course lecturer	58	96%	Very worthy
Total score			191	

Based on the validation test results in table 5 for the pop up boo media, validator 1 (content expert) gave a score percentage of 95% in the category "very feasible" without revision, while validator 2 "content expert" gave a score percentage of 96% in the same category. The material is rated "very feasible" without change, with both material validators giving it an overall average score of 95%. When converted to qualitative data, the material feature of this pop-up book media is assessed as "very feasible" and does not require change. The results of media validation by expert validators can be seen in Table 4 below.

Table 4. Results of Media Validation

No.	Responden	Total score	Presentage	criteria
1.	Media lecturer	44	73%	Very worthy
2.	Media lecturer	38	63%	Very worthy
	Total score		136	

According to the validation test findings in table 4 for the pop up book media, the first validation was performed by validator media 1 (media expert), who provided a score of 73% as 'worthy', while validator 2 (media expert) gave a score of 63% in the fairly worthy category. When turned into qualitative data, the material feature of this pop-up book media is deemed 'worthy' of changes. After revising the pop-up book media based on the first validation's ideas and criticisms, media expert validator 1 and validator 2 performed a second validation. The results of the assessment of the media aspect of the pop up book in the second valdation can be seen in the following table 5.

Table 5. Results of Media Validation

No.	Responden	Total score	Presentage	criteria
1.	Media lecturer	59	98%	Very worthy
2.	Media lecturer	58	96%	Very worthy
	Total score		136	

The table above shows the findings of the media aspect assessment performed by a media expert on the pop-up book media during the second validation. The researcher received a percentage of 98% from validator 1 in the category 'very feasible', as well as a score of 96% from validator 2. The average results of the media validation in stage can be seen in Table 6.

Table 6. Overall Results of Media Validation 1 and 2

Validation 1	Validation 2	Average	Criteria
73%	98%	85,5%	Very worthy
63%	96%	79,5%	worthy
	Average	82,5%	Very wothy

The overall average score from both expert media validators is 82,5%, which falls into the category of "very feasible" without revision. Therefor, it can be

concluded that the pop up book media on cultural wealth material developed is very feasible to use.

d. Implementation

The implementation stage involves implementing or practicing the pop-up book media directly with pupils. The researcher begins the session by quickly explaining the topic on cultural richness, then introduces the pop up book medium and proceeds to explain how to use it, before separating the students into five groups and handing out worksheets. Using the pop-up book media, each group works on the questions on the student worksheet. During the learning process, the researcher also conducted observations to determine how the students responded to the pop up book media: see the observation figure 3 below.

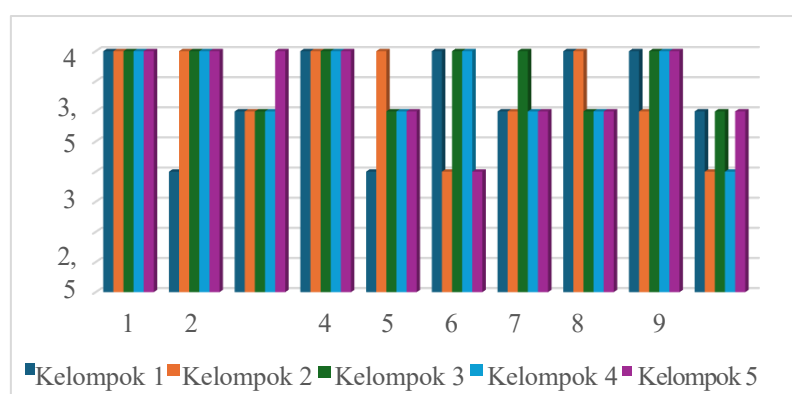


Figure 3. Graph of Observation Results

In image 3, it shows the number of observations of students conducted in groups during the learning process using pop up book media. During the learning process, group one exhibited high interest and understanding of the material on cultural wealth and collaboration. Group two showed the same feelings, while group three also shows the same feeling but the students are still less active, group four still lacks confidence and has a low attitude in appreciating cultural diversity, while group five collaborates well. Nevertheless, all groups successfully collaborated and completed the learning well.

e. Evaluation

The final stage of this research is evaluation, in this case the researcher conducted formative and summative evaluations by distributing response questionnaires to students and teachers, as well as evaluation tests to students. Based on the table above, the score obtained from teacher responses 96% with a very good category, while the student responses yield a percentage of 85% also in the very good category. Thus, the average score obtained from both teacher and student responses is 90,5%, which falls into the very good category. The average results of the responses from students and teachers can be seen in Table 7.

Table 7. Overall Results of Teacher and Student Responses

No	Response result	Percentage	Category
1	Teacher	96%	Very good
2	Student	85%	Very good
	<b>Average</b>	<b>90,5%</b>	<b>Very good</b>

Based on the table above, the results of the teacher's responses show a percentage of 96%, placing it in the category of very good. However, the teacher's feedback still includes suggestions for improvement on several materials and media. Regarding the materials, the teachers suggest adding examples of local cultures that exist around the area of residence to make it more relevant. As for the suggestion for improving the media, the teachers recommend that several pop up sections that are still easily torn should be replaced with thicker material, and a qr code should be added that can be scanned to view cultural videos directly. The results of the student responses involving 20 students, as indicated in the table above, demonstrate that the total score earned is 171 out of a possible 200. The student responses yielded an average score of 85%, indicating that the pop up book media is well regarded by the pupils.

In addition, student were also given evaluation questions aimed at assessing how far the students understand the material on cultural wealth. The 8 following table presents the results of the student's evaluation questions.

Table 8. Evaluation Test Results

No	Indicator	Form the question	Correct answer	Wrong answer
1.	Explaining the factors that contribute to the multitude of cultures in Indonesia	Multiple choice	19	1
2.	Mention the traditional houses from west sumatra.	Multiple choice	20	0
3.	Determining the origin of the kecak dance	Multiple choice	20	0
4.	Understanding the importance of appreciating culture for national unity	Multiple choice	20	0
5.	Mention examples of typical regional foods in Indonesia	Brief filling	20	0
6.	Mention two ways to appreciate cultural wealth	Brief filling	16	4
7.	Mention the names of traditional clothing from central java	Brief filling	18	2
8	Explaining the reasons for the many regional languages in Indonesia	essay	19	1
9.	Expressing opinions on how to preserve local culture	essay	18	2
10	Mention three traditional musical instruments, along with their region of origin	essay	20	0

The results of the thinking ability level of fourth grade students after using the pop up book media are presented in table 13. The description of the students thinking ability data shows an improvement in critical thinking skills, with a uniform increase across all indicators of thinking ability. The evaluation questions completed independently by 20 students indicate that the students understand the material on cultural wealth. Indicator students thinking (factual understanding) is very good in questions 2,3,4,5,10. Conceptual understanding is good, but there are some minor mistakes in questions 1,6,7,8,9. Critical and analytical thinking still needs improvement, especially in essay questions 8 and 9.

## **Discussion**

This study suggests that using pop-up book media is ideal for teaching IPAS material on cultural wealth in fourth grade, with analysis indicating an increase in student engagement while learning with pop-up book media, where they are neither bored nor sleepy and have a high level of curiosity (Gashaj et al., 2023). Students that are bored are less likely to understand the subject offered (Denton et al., 2020). hence, the employment of pop up book media in the IPAS learning process successfully provides a favorable effect, thereby improving motivation and minimizing student boredom during lectures. The increase in student interest in learning environment is characterized by activities, attraction, meaningfulness, and social interaction (Olvi Steva Surentu et al., 2024). The needs analysis results show that students are more inspired by visual and interactive media: mixing multimedia and visual aspects in education increases student engagement and motivation. In the research, the pop-up book created with Canva design enables for the incorporation of numerous features, graphics, and interactive quizzes. This method makes studying more enjoyable and allows students to apply the content to real-life situations (Halimah et al., 2024). The investigation demonstrates that the pop-up book media can be integrated with the outcomes and learning objectives established in the Merdeka Elementary School Curriculum (Fauziyah and Mulyani, 2024).

The development of this pop up book medium comprises validation by content and media professionals. The validation findings show that the material supplied is highly relevant and appropriate for the learning objectives (Astra et al., 2015). Similarly, the validation shows that the media used in learning is very suitable, clear, and appropriate to the student level of understanding. This research is consistent with (Yuniarizki and Prasetyaningtyas, 2025) that learning will be more active and effective is multimedia is accompanied by language that is suitable for the audience and straightforward. This validation ensures that the media is not only good pedagogically, but also accessible to learners (Nurhikmah et al., 2018). Based on research results, pop up book media is very effective in conveying cultural wealth material. The application of pop up book media is one approach to make IPAS learning more concrete, interactive, and meaningful, which is greatly needed in this globalization era (Anggraini et al., 2025). Students are able to complete LKPD questions and evaluation questions well, as an indicator of their ability to think ctically in problem solving with multiple solution, just as students do when

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collaborating in groups. Critical thinking lies in the student ability to independently organize their thoughts through evaluation questions in solving new problems.

Mustofa et al. (2024) found that using media helps pupils acquire thinking and problem-solving skills, leading to improved elaboration abilities. The ability of students to think critically is enhanced by the use of pop-up books in their research, which confirms that the use of pop-up books significantly improves student achievement in learning, indicating that an increase in students' thinking skills is positively related to their understanding of the material and academic success. The improvement in student learning can be seen in the description of the results of the evaluation questions conducted. The aspects that have been mastered by the students are factual knowledge such as names, traditional houses, special foods, regional dances, and musical instruments, which have been well understood by the students. The aspects that need to be improved are analytical and critical thinking skills, especially in essay and short answer questions that require more in depth explanations. Feedback from instructors and students indicated that the pop-up book media developed could boost student motivation while also making it easier for teachers to present curriculum. Positive responses from students indicate that pop-up books successfully create a more engaging and interactive learning experience, supporting the statement that effective learning requires a combination of good design elements and appropriate technology (Ita et al., 2024).

#### 4. Conclusion

This study successfully answered the research question regarding the feasibility and effectiveness of pop-up books in science and mathematics learning in fourth grade elementary school cultural heritage lessons. The results showed that the developed media attracted students' attention, motivated them to learn, and facilitated their understanding of the concepts taught. Thus, pop-up books are proven to be suitable for supporting a more interactive and enjoyable learning process. However, this study still has limitations, particularly in terms of the limited scope of the subject to one school and the relatively small number of participants. Therefore, further research needs to involve a broader sample and testing in different learning contexts so that the results are more comprehensive and can be generalized more widely.

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