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Development of Flipbook-Based Digital Teaching Media to Increase Student Learning Interest in Science Material

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Abstract

In this research and development aims to produce a product in the form of digital teaching media based on Flipbook on the subject of Science and Natural Sciences, the product developed is then tested for its feasibility by experts and gets responses from teachers and students. The design used by researchers to develop digital teaching media based on Flipbook is a design with the ADDIE development model. This research was applied to fourth grade students on the material "Indonesiaku Kaya Budaya" which took place at SDS Islam Ash-Sholihah. Researchers chose this subject because of the low interest in learning students and the lack of teachers who use learning media in the teaching and learning process. The types of data collected in this study were in the form of observation results, questionnaires (questionnaires), and documentation. Measuring instruments in research are usually called research instruments. The instrument in this study is an instrument to measure the validity of learning media using a questionnaire with a checklist format with several statements. This questionnaire was given to several media experts and material experts. After the research data was obtained through the questionnaire, data analysis was carried out in the form of N-gain. Based on the results of the research and data analysis that have been carried out, it can be concluded that the development of digital teaching media based on flipbooks has a positive impact on increasing the interest in learning fourth grade students on the subject of Science and Natural Sciences, especially "Indonesiaku Kaya Budaya". This is indicated by the increase in the average value from pretest to posttest, as well as the N-Gain value which is included in the high category for both students (0.7) and teachers (0.8). The use of flipbooks that present material visually, interactively, and interestingly has been proven to be able to increase student involvement and enthusiasm in participating in learning on the science material.

Keywords: Digital Teaching Media, Flipbook, Learning Interest

Introduction

The teaching of IPAS (Natural and Social Sciences) subjects at the elementary school level is often considered uninteresting by students because of its conventional presentation (Nurfadhillah et al., 2021). Low student interest in IPAS material can lead to low comprehension and learning outcomes (Amalia & Fathurrahman, 2023). Therefore, innovative strategies are needed to deliver material that can foster student interest in learning (Hatimah et al., 2021).

Innovation is needed to create digital-based learning media that can be accessed by students and can make it easier for students to carry out learning activities wherever they are (Hakim & Yulia, 2024). In order for students to easily access the developed learning media, software that is compatible with the Android platform must be utilized (Eliasar & Astuti, 2023). This learning media in the form of a Flipbook-based digital book is editing software or an electronic book equipped with images, music,

animations, sounds, videos, or other supporting materials (Yulianti et al., 2023). In addition, it can also be flipped like a real book (Astri, 2021). Thus, the features presented in this digital flipbook can improve material comprehension because there are interactive media that are interesting and not monotonous (Prasasti & Anas, 2023). Therefore, this flipbook is a medium that can be a reference for teachers and education practitioners to support and fulfill teaching and learning skills (Sahara & Silalahi, 2022). In addition, this digital flipbook is expected to increase students' interest in learning to understand the material presented by teachers or educators (Landina & Agustiana, 2022) .

The researchers chose the material "Indonesiaku Kaya Budaya" (My Indonesia is Rich in Culture) which is taught to fourth-grade students at SDS Islam Ash-Sholihah to be included in the flipbook media, with the hope of attracting students' interest in reading and understanding the material. This material was chosen because it contains the rich culture of Indonesia that is very close to the daily lives of students, but often receives little attention due to its monotonous and less visual presentation (Saputri & Darwis, 2022; Endaryati et al., 2021; Azzahra, 2024). In fact, understanding cultural diversity from an early age is very important in shaping students' character to be tolerant and patriotic (Hasanah & Yarshal, 2020).

Based on observations with the fourth-grade teacher at SDS Islam Ash-Sholihah, it was found that most students showed a lack of enthusiasm in participating in IPAS lessons, especially in the "My Indonesia is Rich in Culture" material. The teacher said that the teaching methods used so far were still dominated by lectures and relied on the use of Student Worksheets (LKS) and IPAS textbooks provided by the government as the main sources of learning (Andini & Yarshal, 2024).

Therefore, the use of digital flipbooks is considered to provide significant benefits in increasing students' interest in learning (Arisandhi et al., 2023). Digital flipbooks enable more attractive presentation of material through the integration of text, images, audio, and other interactive elements (Landong et al., 2024). This creates a more enjoyable and meaningful learning experience for students (Nuryani & Abadi, 2021). With a display that resembles a real book but is packaged in a digital format, flipbooks provide flexibility for teachers in delivering material in a variety of ways (Ilyani, 2014). In addition, they also help students understand concepts in IPAS learning in a more visual and contextual (Kurnia & Sunaryati, 2023).

Therefore, through the application of flipbook-based digital teaching media in the "My Indonesia is Rich in Culture" material, it is hoped that students will have a higher interest in learning and be able to build a deeper understanding of the values of cultural diversity in Indonesia. Therefore, the development of this digital teaching media can be an effective alternative solution in overcoming low student interest in learning, which has been one of the challenges in the IPAS learning process.

Methods

The research design used was Research and Development (R&D) or development research. The aim of this research and development was to produce a digital teaching media product based on Flipbook for IPAS material. The developed product was then tested for feasibility by experts and received feedback from teachers and students. The design used by the researcher to develop digital teaching media based on Flipbook was the ADDIE development model.

This research was applied to fourth-grade students studying the subject "My Indonesia is Rich in Culture" at SDS Islam Ash-Sholihah. The researcher chose this subject because of the low level of student interest in learning and the lack of teachers using learning media in the teaching and learning process.

The types of data collected in this study were observation results, questionnaires, and documentation. The measuring tools in this study are usually called research instruments. The instruments in this study were instruments to measure the validity of learning media using a questionnaire in the form of a checklist with several statements. This questionnaire was given to several media experts and subject matter experts. In addition to the instrument for validators, there is also an instrument to obtain data on the feasibility of flipbook-based digital teaching media in the form of one-

on-one trials, small group trials, and large group trials. These trials were conducted before the flipbook-based digital teaching media was implemented in learning. In addition to the three types of questionnaires above, there is also a questionnaire to measure the variable of student interest in learning. The following is an outline of the instrument for student learning interest:

Table 1.
Blueprint of Instrument for Students' Learning Interest

No.	Aspect Assessed	Item Numbers	Type of Instrument
1	Pleasure in learning activities	1, 2, 3, 4, 5, 6	Checklist
2	Concentration and attention toward learning	7, 8, 9, 10, 11, 12, 13	Checklist
3	Desire and enthusiasm to be active in learning	14, 15, 16, 17, 18	Checklist
4	Effort to realize the desire to learn	19, 20	Checklist

1. Qualitative Analysis
   Qualitative analysis is used to describe the results of observations, validation lecturers' suggestions, and documentation notes during implementation. The data are analyzed descriptively and qualitatively. Several suggestions are used to improve the product during the revision stage, while the documentation notes are described to determine the usefulness of the developed product when applied in the learning process.
2. Quantitative Analysis
   The quantitative descriptive analysis technique is obtained from a descriptive questionnaire that is then quantified to produce numerical data. The analysis technique used to examine the quantitative data from the validation results is the calculation of the mean score. The function of this calculation is to determine the final ranking or level of each item assessed. Meanwhile, the criteria for evaluating the digital learning media product based on flipbook are determined using the following value principles:

Table 2.
Product Feasibility Criteria

Score	Description
0 – 20%	Not Feasible
36 – 52.9%	Less Feasible
52 – 67.9%	Fairly Feasible
68 – 83.9%	Feasible
84 – 100%	Highly Feasible

A digital learning medium developed by the researcher is considered feasible for use if its achievement level meets the criteria of more than 68% of all elements contained in the expert validation questionnaires, both for material experts and media experts. In this study, the developed media must meet the valid/feasible criteria. Therefore, revisions are made if the product has not yet met the validity criteria.

After the research data are obtained through questionnaires, data analysis is carried out. According to Susanto (in Wulandari, 2016, p.88), to determine the improvement of students' learning interest before and after the treatment, the researcher uses the N-gain test. The following is the formula used to calculate the N-gain:

$$N_{gain} = \frac{S_{post} - S_{pre}}{100 - S_{pre}}$$

Description:

N-Gain (g) : the magnitude of the gain factor

Posttest score : the score obtained from the final test

Pretest score : the score obtained from the initial test
Maximum score : the highest possible score on the questionnaire test

Table 3.
Criteria for Gain Factor Magnitude

Interval	Category
$g > 0.7$	High
$0.3 \leq g \leq 0.7$	Medium
$g < 0.3$	Low

Results and Discussions

1. Results

Based on the ADDIE development model, the steps in the process of developing digital learning media based on flipbook technology to enhance students' learning interest in the Science, Environment, and Social Studies (IPAS) subject for Grade 4 at SD Swasta Islam Ash-Sholihah are as follows. The first step is Analysis, where the aspects analyzed include the curriculum and students' learning needs. The second step is Design, in which the researcher begins designing the initial pages of the developed learning media. Next, the researcher compiles the IPAS material for Chapter 6, "My Indonesia is Rich in Culture." Afterward, the images designed using Canva and the compiled learning materials are combined into one digital format using the Flipbook Heyzine application. Once the flipbook-based digital learning media design is completed, the researcher proceeds to the third stage, Development, which begins with creating the product and preparing validation instruments. These instruments are later used to assess the feasibility of the developed learning media based on evaluations from several expert reviewers, which include material validation and media validation. The fourth stage is Implementation, in which the validated product is tested. A limited trial is conducted specifically, an individual trial to observe the responses of teachers and students. Through this stage, the researcher identifies students' learning interest when using the developed flipbook-based digital learning media. The fifth stage is Evaluation, where the purpose is to reassess and ensure that the developed flipbook-based digital learning media is feasible for use in the learning process.

The flipbook-based digital learning media designed to improve students' learning interest in IPAS was validated by five reviewers, consisting of material experts and media experts. The results of the validation from the two types of experts are presented in the following table:

Table 4.
Average Results of Expert Validation

No.	Validator	Validator	Criteria
1	Material Expert	95%	Highly Feasible
2	Media Expert (Phase II)	92.63%	Highly Feasible
	Average Percentage Score	93.81%	Highly Feasible

Based on the data obtained from the two expert validators, the average percentage score was 91.5%. This validation result indicates that the flipbook-based digital learning media meets the **"**Highly Feasible" criteria. This means that the flipbook-based digital learning media can be used in the learning process, with several revisions as suggested by the validators. Furthermore, the analysis of critiques, suggestions, and comments regarding the feasibility of the flipbook-based digital learning media provided by the validators serves as a reference for revising and improving the product. The suggestions from the validators are used as a basis for refining the product so that

it can be more effective for learning and meet the standard criteria for instructional media development.

The flipbook-based digital learning media that has been declared feasible is used as a learning resource for students and can now be applied more widely (Sibarani & Silalahi, 2024). The researcher distributed this learning media at SD Swasta Islam Ash-Sholihah. It can also be accessed online via the researcher's Academia.edu account through the following link: https://heyzine.com/flip-book/6b78f0bcee.html.

Based on the results of the teacher responses, student responses, and students' learning interest in the IPAS subject after using the product, the researcher tested the teachers' and students' responses to the product to ensure its alignment with field expectations and needs. The trial was conducted by implementing a learning session using the flipbook-based digital learning media. After completing the learning activity, both teachers and students were given questionnaires. The response questionnaires for teachers and students, as well as the learning interest questionnaire for students, were distributed to evaluate whether the product met the expected criteria. The results from these respondents are presented in the following table:

Table 5.
Results of Respondents' Responses

No.	Validation Type	Percentage	Criteria
1	Teacher Response	93.33%	Highly Feasible
2	Student Response	89.4%	Highly Feasible
3	Students' Learning Interest Response	91.45%	Very Satisfied

Based on the table above, the results of the teacher response questionnaire obtained a percentage score of **93.33%**, which falls under the "Highly Feasible" category. The results of the student response questionnaire for the flipbook-based digital learning media showed a percentage score of 89.4%, also categorized as "Highly Feasible." In addition to examining teacher and student responses, the researcher also assessed students' learning interest after using the developed flipbook-based digital learning media through a learning interest questionnaire. The results of this questionnaire showed a percentage score of 91.45%, which is classified as "Very Satisfied."

The assessment results from both teachers and students indicate that the developed product had a positive impact on the learning process and successfully increased students' learning interest when using the flipbook-based digital learning media. The use of this media made students feel happy and more motivated to learn. The learning process referred to in this study specifically focused on the IPAS subject, Chapter 6: "My Indonesia is Rich in Culture."

The measurement of students' learning interest was conducted using a questionnaire administered to 26 fourth-grade students at SD Swasta Islam Ash-Sholihah, given twice — the first before using the media (pretest) and the second after using the media (posttest). The calculation of students' learning interest employed the N-gain test to determine the extent of improvement in students' learning interest before and after using the flipbook-based digital learning media. The results of the measurement of students' learning interest can be seen in the following table:

Table 6.
Results of Students' Learning Interest Measurement Using the N-Gain Test

No	Category	Students	Teachers
1	Average Pretest Score	68.8	49
2	Average Posttest Score	88.5	75
3	Maximum Score / Category	91.45% (Very Satisfied)	Very Satisfied
4	N-Gain	0.7	0.8
5	Conclusion	High	High

Based on the results of the measurement of students' learning interest using the N-Gain test as shown in Table 6, there was a significant increase after the implementation of the flipbook-based digital learning media. The average pretest score of students before using the flipbook media was 68.8, while the teachers' average score was 49. After learning with the flipbook media, the students' average posttest score increased to 88.5, and the teachers' average score rose to 75. This increase indicates that the use of flipbook media had a positive impact on enhancing students' learning interest and engagement in the learning process.

In addition, the maximum score achieved by the students reached 91.45%, which falls into the "Very Satisfied" category, indicating that students were highly enthusiastic and enjoyed the learning process using this media. The N-Gain calculation results showed a value of 0.7 for students and 0.8 for teachers, both categorized as "High."

2. Discussions

The development of flipbook-based digital learning media was carried out through the ADDIE model, consisting of the stages of Analysis, Design, Development, Implementation, and Evaluation. Based on the results of expert validation, the developed media achieved an average score of 91.5%, categorized as "Highly Feasible." This indicates that both material and media experts agreed that the content, presentation, and design of the flipbook-based learning media met the standards of validity and feasibility for use in the learning process. Minor revisions were made according to the experts' feedback to further improve the quality of the product.

The implementation stage involved limited trials with both teachers and students to measure their responses to the developed product. The results showed that the teacher response reached 93.33%, while the student response was 89.4%, both falling under the "Highly Feasible" category. This finding demonstrates that the flipbook-based digital learning media was well-received, effectively meeting the expectations and needs of classroom users. The positive responses indicate that the media not only supported teachers in delivering material but also created a more engaging learning atmosphere for students.

Furthermore, students' learning interest after using the flipbook-based digital learning media reached 91.45%, categorized as "Very Satisfied." This suggests that the learning process using the media successfully stimulated students' enthusiasm, curiosity, and enjoyment in learning, particularly for the IPAS subject, Chapter 6 "My Indonesia is Rich in Culture." The interactive features and visual presentation provided by the flipbook contributed to maintaining students' attention and motivation during learning activities.

The N-Gain analysis results further confirmed the effectiveness of the developed media. The average pretest score for students was 68.8, which increased to 88.5 in the posttest, while teachers' scores improved from 49 to 75. The calculated N-Gain values were 0.7 for students and 0.8 for teachers, both categorized as "High." This significant improvement demonstrates that the use of flipbook-based digital media positively influenced students' learning interest and teachers' instructional engagement.

These findings are consistent with the research conducted by Oktaviani and Syahputra (2022), which demonstrated that the use of interactive flipbook media can significantly increase students' learning interest and learning outcomes, particularly in conceptual learning materials.

Another study by **Sari and Nugroho (2021)** also reinforces these findings, indicating that learning assisted by digital flipbooks encourages students to be more active due to the engaging and easily understood presentation of materials. Thus, it can be concluded that the implementation of **digital flipbook-based learning media** effectively enhances both students' and teachers' learning interest and serves as an alternative solution to the issue of low learning motivation in IPAS (Science, Environment, Technology, and Society) instruction.

In addition to increasing learning interest, other findings also reveal that the use of flipbooks helps students improve their visual literacy skills, as they can more easily connect text with images or illustrations presented in an appealing way. This is consistent with the findings of

Pratama and Yuliana (2020), who stated that interactive digital media such as flipbooks can strengthen students' memory retention, enhance critical thinking skills, and improve overall conceptual understanding.

Conclusion

Based on the results of this study, it can be concluded that the implementation of the Project Based Learning (PjBL) learning model can improve students' learning motivation in science learning. This can be seen from the increase in the scores of the learning motivation questionnaire and student tests in the learning process. In addition, the implementation of PjBL also makes learning more meaningful and enjoyable for students and activates them in the learning process. With this increase, it is expected to have a positive impact on student learning outcomes. Therefore, the PjBL model can be used as an alternative learning model that is effective in improving student learning motivation and learning outcomes.

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