OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Development of Flipbook Teaching Materials on Earth Surface Changes to Improve Learning Outcomes of Fifth Grade Elementary School Students

Alvida Ariani [1], **Dhian Dwi Nur Wenda** [2], **Ita Kurnia** [3*]

[1,2,3*] Elementary School Teacher Education Study Program, Universitas Nusantara PGRI Kediri, Kediri City, East Java Province, Indonesia.

Corresponding Email: itakurnia@unpkediri.ac.id [1*]

Received: 10 July 2025; Accepted: 25 July 2025; Published: 30 July 2025.

Abstract

This study was motivated by existing issues at SDN Tarokan 4. Based on the results of interviews, classroom observations, and an analysis of students' learning outcomes by the grade V teacher, it was found that there was a lack of variety in teaching materials and suboptimal use of technology in the classroom. Out of 41 students, only 13 achieved scores above the Minimum Learning Mastery Criteria (KKTP) in the topic of changes to the Earth's surface. To address these issues, a flipbook-based teaching material was developed to improve student learning outcomes. The aim of this research is to determine the validity, practicality, and effectiveness of the developed flipbook teaching material. This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation. The trial subjects comprised 41 students, with 10 participating in the limited trial and 31 in the broader trial. Instruments used included validation sheets, teacher and student response questionnaires, as well as pretest and posttest assessments. Validation results from subject matter experts and teaching material experts indicated that the product falls under the "highly valid" category, with an average percentage of 93%. Practicality analysis based on teacher response questionnaires in the limited trial showed a percentage of 100%, while student response questionnaires in the broader trial yielded a percentage of 82.5%. Both are categorized as "highly practical." Meanwhile, the effectiveness of the teaching material was demonstrated through the N-gain test, which showed a 77.07% increase between pretest and posttest scores, classified as "effective." Based on these results, the flipbook teaching material is deemed suitable for use in teaching the topic of changes to the Earth's surface to improve learning outcomes for grade V elementary students.

Keywords: Teaching Material; Flipbook; Changes to The Earth's Surface; Learning Outcomes; ADDIE Model.

Introduction

Primary education serves as the fundamental stage for children in understanding various basic concepts. At this level, students begin to acquire essential knowledge that will guide them as they progress to higher levels of education. Along with the advancement of time, primary education is required to continuously innovate, including in the learning tools used in the classroom. A significant change in curriculum context is the implementation of the Merdeka Curriculum, which combines science and social studies into a single subject called IPAS, adopting a student-centered learning approach. One of the essential tools needed by teachers is teaching materials. Utomo *et al*. (2016) emphasize that teachers need to have appropriate teaching materials to support classroom learning activities. Well-designed teaching materials can enhance student learning outcomes and play a crucial role in achieving educational goals. However, the implementation of IPAS learning in schools still faces several challenges. Based on observations and interviews conducted on November 9, 2024, at SDN Tarokan 4, it was found that teachers predominantly use

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

conventional teaching materials, such as textbooks and worksheets, without utilizing available digital technology. In fact, facilities such as LCD projectors, laptops, and students' access to digital devices are already present. The lack of variety in teaching materials has an impact on students' interest and learning outcomes, particularly in the topic of changes to the Earth's surface. Furthermore, data on grade V students' learning outcomes show that, for this topic, most students have not reached the Minimum Learning Mastery Criteria (KKTP). Out of 41 students, only 13 (31.7%) achieved the standard, while 28 (68.3%) scored below it. This highlights the need for innovative teaching materials that can help students better understand the subject matter.

One relevant innovation in teaching materials, especially in the context of digital learning, is transforming printed textbooks into digital modules, commonly known as digital books or flipbooks (Utami, 2023). These are equipped with features designed to support students' understanding and enhance the learning process. In principle, flipbooks share similarities with traditional printed materials (Yulaika *et al*., 2020), maintaining learning objectives, content, and assessments aligned with the curriculum. However, the presentation is more engaging, as it incorporates text, videos, images, and hyperlinks to support the material. Once developed, flipbooks can be published in SWF, HTML, or PDF formats and distributed to students via various online learning applications, such as WhatsApp, email, Learning Management Systems (LMS), and other platforms (Sa'diyah, 2021). Flipbooks can be accessed via links on multiple devices—phones, computers, or laptops—making them more flexible than printed books or modules. Flipbooks offer several advantages. One key benefit is their accessibility anytime and anywhere on electronic devices connected to the internet. Supported by multimedia elements—text, images, audio, animation, and video—flipbooks can be read on electronic devices (Dewi, 2023), making the learning process more enjoyable and engaging. However, there are also limitations to consider, such as the need for adequate infrastructure and sufficient ICT skills among teachers and students (Talitha *et al*., 2023). Therefore, adopting flipbooks as teaching materials requires appropriate strategies, including providing proper devices, digital skills training, and policy support from schools and government, to ensure effective implementation. With the ongoing development of digital technology and shifts in educational paradigms, innovation in teaching material development has become a central focus in supporting adaptive, contextual, and student-centered learning. Integrating digital media, such as interactive flipbooks, is one approach that continues to evolve. With learning resources in the form of flipbooks, students find it easier to study new material (Rini *et al*., 2021). Previous studies have shown that digital flipbooks have significant potential to improve learning effectiveness. Yulaika *et al*. (2020) found that flipbook-based teaching materials can enhance learning outcomes and multisensory engagement, particularly in economics education. Their research highlighted the visual and interactive benefits of flipbooks in increasing student involvement. Meanwhile, Utami (2023) developed flipbook teaching materials for differentiated learning in grade IV, finding them highly valid and practical for classroom use. Mualiffah (2020) focused on integrating local wisdom values into social studies flipbooks and demonstrated their effectiveness through statistical testing.

Nevertheless, there are research gaps that have not been widely explored. Most flipbook teaching material development has focused on social or economic subjects, while the IPAS theme—especially the topic of changes to the Earth's surface—has received less specific attention. Additionally, previous technological approaches have generally used conventional or offline software. The potential of cloud-based digital tools such as Canva and Heyzine Flipbooks has not yet been fully realized in the context of primary education. This study introduces several novel aspects: (1) the development focuses specifically on the topic of "Changes to the Earth's Surface" in IPAS for grade V, a subject empirically proven to be challenging for students; (2) the teaching materials are developed using modern digital applications, Canva and Heyzine Flipbooks, which allow for professional, interactive, and easily accessible materials across devices; (3) the implementation context connects digital media development with actual classroom conditions in schools that have technological facilities but have not yet optimized their use; and (4) the aim to strengthen digital literacy among teachers and students, supporting both subject comprehension and the broader transformation towards interactive, web-based learning in primary education. Thus, this research not only broadens the scope of flipbook utilization in learning but also contributes methodologically and practically to the development of technology-based teaching materials suited to the characteristics of 21st-century learners.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Before conducting this study, the researcher reviewed relevant previous studies. For example, Yulaika *et al*. (2020) concluded that electronic flipbook-based teaching materials in economics had a positive impact on learning outcomes and student engagement, including visual, oral, auditory, writing, and emotional involvement. Utami (2023), in her research titled "Development of Flipbook-Based Teaching Materials to Support Differentiated Learning in Grade IV Elementary School," found that flipbook-based materials were highly valid and practical for supporting differentiated instruction. Another study by Mualiffah (2020), "Development of Interactive Electronic Flipbook Teaching Materials Based on Local Wisdom as a Learning Resource for Social Studies Content for Grade V Students at SDN 1 Wulung Blora," showed that these materials were highly feasible. Their effectiveness was demonstrated by a significant difference between pre-test and post-test results, with an average N-gain of 0.355, classified as moderate. However, this research presents significant differences from previous studies. The novelty of this research lies in two main aspects. First, the development of teaching materials focuses on the topic of changes to the Earth's surface for grade V students, a topic that has not been widely explored in previous studies. Second, the media developed utilizes modern digital applications such as Canva and Heyzine Flipbooks, which make it possible to create digital teaching materials that are more interactive, engaging, and aligned with the characteristics of today's learners.

Literature Review

Teaching materials play a central role in the learning process, serving as a guide for teachers and a primary learning resource for students. According to Nuryasana and Desiningrum (2020), teaching materials are a set of resources designed to facilitate the learning process so that students can achieve predetermined objectives. Teaching materials can take the form of either printed or digital media, depending on the needs and context of the learning process (Kosasih, 2021). In their development, teaching materials must consider the developmental stages of learners as well as the intended learning objectives (Wenda *et al*., 2023). Functionally, teaching materials not only serve as a guideline for teachers and a reference for students, but also act as tools for evaluating learning achievement and for creating a conducive learning environment, especially when presented in an engaging and relevant manner (Nurdyansyah & Mutala'liah, 2018). However, much of the previous research has focused on the development of print-based teaching materials. In the context of advancements in information and communication technology, exploration of interactive teaching materials such as flipbooks remains limited, particularly in IPAS (Integrated Science and Social Studies) learning at the elementary level. This indicates a gap in the development of digital teaching materials that meet the demands of the times and the characteristics of elementary school students.

With technological advancements, flipbooks have emerged as digital learning resources that offer more interactive and independent learning experiences. Flipbooks are systematically designed into smaller learning segments to support the achievement of learning objectives (Rohmah *et al*., 2024). As a form of interactive teaching material, flipbooks can integrate text, images, videos, and audio in a single digital medium, simulating the experience of reading a physical book with animated page effects (Widyasari, 2021). Various studies have shown that flipbooks facilitate independent learning, enhance the understanding of abstract concepts, and foster students' enthusiasm and motivation for learning. In addition, flipbooks can increase interest and provide more varied learning experiences, helping teachers deliver material in a more structured and engaging way, thereby making it easier for students to grasp abstract concepts and increasing their interest (Arina *et al*., 2020). The use of flipbooks has been proven to enrich students' learning experiences and assist teachers in presenting material more effectively. Diki *et al*. (2022) emphasize that students need examples that are within their reach or relevant to their daily lives to better understand the material being taught. Nevertheless, the implementation of flipbooks also faces challenges, such as dependence on digital devices, internet connectivity, and the ICT skills of both teachers and students (Talitha *et al*., 2023). This is further supported by Prasetyono & Hariyono (2020), who note, "Another disadvantage is that flipbooks require a computer, smartphone, and internet connection to use." Here lies the gap: there has been little research on the development of flipbooks tailored to the cognitive characteristics of elementary students, especially in IPAS topics such as changes to the Earth's surface. This is partly due to limitations in computer access and restrictions on bringing smartphones to elementary schools.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

The integration of teaching materials and flipbooks in the form of interactive digital media is believed to improve the quality of the learning process and strengthen students' memory retention through multimedia features (Ulandari *et al*., 2023). The utilization of such technology aims to enhance the effectiveness and quality of classroom learning (Wenda, 2016). This is relevant to the concept of learning outcomes, which relates to changes in students' knowledge, attitudes, and skills influenced by instructional media. The factors affecting learning success can be both internal and external (Sari & Kurnia, 2022). Students can learn optimally when there are motivating factors, one of which is the learning activity itself (Luthfi *et al*., 2022). At the elementary school age, teachers often refer to this period as the "school age," when children aged 6–12 receive formal education for the first time. Therefore, the active role of teachers is crucial in creating a meaningful learning environment (Vikiantika *et al*., 2021). Additionally, the characteristics of fifth-grade elementary students, who are at the concrete operational stage, require the use of media that can visually and interactively explain concepts (Dwisa, 2022). Fifth-grade students at SDN Tarokan, for example, have shown greater responsiveness to visual and animated stimuli compared to lengthy text, making flipbooks a strategic choice to accommodate their visual learning styles.

The Merdeka Curriculum introduces IPAS (Integrated Science and Social Studies) as an integration of science and social studies to foster contextual understanding of both fields (Kemendikbudristek, 2022). One important topic in fifth-grade IPAS is changes to the Earth's surface, which includes subjects such as the structure of the Earth, the water cycle, and other geomorphological phenomena. These topics are quite complex for elementary students to understand, thus requiring learning media that can simplify and visualize these concepts. Ghaniem *et al*. (2021) state that visualization through animation and simulation can help students understand scientific concepts more concretely. Therefore, the development of flipbooks featuring animations, videos, and interactivity on the topic of changes to the Earth's surface is considered an effective solution. Through this approach, the present study aims to address the gap in the provision of contextual, engaging, and technologically aligned digital IPAS teaching materials that suit students' characteristics.

A review of previous research serves as one of the foundations for this study, helping to strengthen and enrich the theoretical basis. For example, research by Yulaika *et al*. (2020) titled "Development of Electronic Flipbook-Based Teaching Materials to Improve Student Learning Outcomes" found that: (1) validation results showed that the material component scored 0.83, the presentation component scored 0.77 (high criteria), the language component scored 0.88 (high criteria), and the graphic feasibility scored 0.76 (high criteria); (2) teacher practicality in managing learning with electronic teaching materials had an average score of 4.76 from two observers, indicating that the learning process went well; (3) the practicality and activeness of students in learning with electronic teaching materials was very high, with an average of 95.5%, within the criteria range of 75%–100%; and (4) the effectiveness of the teaching materials was tested using a t-test, resulting in a sig. (2-tailed) value of 0.000 < 0.05, indicating a significant difference between pre-test and post-test results.

Furthermore, research by Utami (2023) entitled "Development of Flipbook-Based Teaching Materials to Support Differentiated Learning in Fourth-Grade Elementary School" concluded that: (1) the developed product was an electronic module in flipbook format to support differentiated learning in grade IV; (2) validity results for the language aspect averaged 4.8, the media aspect averaged 4.7, and the material aspect averaged 4.6, all classified as very valid; (3) practicality results based on teacher response questionnaires averaged 4.9, and student response questionnaires averaged 4.7, both categorized as very practical. Similarly, research by Mualiffah (2020) from the Elementary School Teacher Education Study Program, Faculty of Education, Universitas Negeri Semarang, titled "Development of Interactive Electronic Flipbook Teaching Materials Based on Local Wisdom as a Learning Resource for Social Studies Content for Fifth-Grade Students at SDN 1 Wulung Blora," demonstrated that the developed teaching materials were highly feasible, with a presentation feasibility percentage of 89.06%, content feasibility of 93.75%, and language feasibility of 93.75%. The effectiveness of the teaching materials was evidenced by a t-test, with a sig. (2-tailed) value of 0.000 < 0.050, indicating a significant difference between pre-test and post-test results. In addition, the average N-gain value obtained was 0.355, which falls into the moderate category.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Methodology

The type of research used in this study is development research, also known as Research and Development (R&D). Research and Development (R&D) is a research method used to develop and produce new products, followed by testing the effectiveness of those products (Sugiyono, 2017). The research design employed in this study is the ADDIE model, which consists of five systematic and sequential phases: Analysis, Design, Development, Implementation, and Evaluation (Rachmawati *et al*., 2023). This research was conducted at SDN Tarokan 4, located in Dusun Sukorejo, Tarokan Village, Tarokan District, Kediri Regency. The subjects of this study were 41 fifth-grade students and one fifth-grade homeroom teacher who participated in the product trial process. The research was carried out during the odd semester of the 2024/2025 academic year. The types of data collected in this study were both qualitative and quantitative. Qualitative data included feedback, suggestions, input, and revisions from expert validation sheets, as well as teacher and student response questionnaires. Quantitative data were obtained from questionnaires and tests (pre-test and post-test) administered to the trial subjects. The instrument used for data collection in this development research was a questionnaire. Data analysis techniques in this study involved descriptive qualitative and descriptive statistical analysis. Descriptive qualitative analysis was used to process data in the form of feedback, suggestions, and input, while descriptive statistical analysis was used to process data obtained from questionnaires and test sheets (pre-test and post-test). The data collected and analyzed in this study were used to assess the validity, practicality, and effectiveness of the developed product.

Table 1. Blueprint of the Material Expert Questionnaire Instrument

No.	Aspects and Indicators	Rating Scale				
		1	2	3	4	5
1.	Content Feasibility					
	1. Alignment with learning outcomes					
	2. Suitability with student development					
	3. Accuracy of learning material substance					
	4. Material in the flipbook is easy to understand					
	5. Benefits for increasing knowledge					
	6. Relevance of material to everyday life					
2.	Presentation Suitability					
	7. Clarity of learning objectives in the flipbook					
	8. Appropriateness of material sequence and overall content					
	9. Completeness of information					
	10. Appropriateness of layout, font type, and size					
	11. Appropriateness of illustrations/images/photos					
	12. Completeness of information (summaries, worksheets, exercises)					
	13. Clarity of learning objectives					
3.	Language Suitability					
	14. All information in the flipbook is clearly readable					
	15. Sentences conform to proper Indonesian grammar					
	16. Use of communicative language					
	17. Sentences are easy to understand					
	18. Sentences are effective					
	19. Consistency in word, term, and sentence usage					
	20. Language does not cause ambiguity					

Source: Savera, 2023.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Table 2. Blueprint of the Teaching Material Expert Validation Questionnaire Instrument

No.	Aspects and Indicators	Rating Scale				
		1	2	3	4	5
1.	Appearance/Design					
	1. Appropriateness of flipbook size					
	2. Suitability of size with content					
	3. Color composition between text and background is appropriate and clearly readable					
	4. Proportional layout (text and images) on the cover page					
	5. Layout of each section is appropriate					
	6. Clarity of titles and content					
2.	Ease of Use					
	7. Flipbook is presented sequentially according to its sections					
	8. Flipbook is easy to operate on laptop/computer/phone					
	9. Content is easily accessible					
3.	Consistency					
	10. Consistency in words, terms, and sentences					
	11. Consistency in font type and size					
	12. Consistency in layout					
4.	Graphics					
	13. Appropriate use of color (not excessive)					
	14. Font type and size are easy to read					
	15. Illustrations/images are clear and not blurry					
	16. Videos run smoothly and are clearly visible					
5.	Benefits					
	17. Steps in the flipbook facilitate independent learning					
	18. Teachers can easily interact using the flipbook					
	19. Students can easily interact with the flipbook					
	20. Able to increase students' attention					

Source: Savera, 2023.

Table 3. Blueprint of the Teacher Response Questionnaire Instrument

Indicator	Rating Scale				
	1	2	3	4	5
1. Suitability of flipbook content with Learning Outcomes					
2. Suitability with Learning Objectives					
3. Ease of use for teaching					
4. Appropriateness for students' needs					
5. Helps teachers present material on changes to the Earth's surface					
6. Can increase students' knowledge and reading interest					
7. Easily accessible by teachers and students					
8. Enables students to learn anywhere					
9. Material explanations and exercises are clear, simple, and easy to understand					
10. Fonts are attractive and easy to read					
11. Flipbook design is visually appealing					
12. Content is complemented by images and audiovisuals					

Source: Maisarah, 2021; Fitriyani, 2024.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Table 4. Blueprint of the Student Response Questionnaire Instrument

No.	Indicator	Student Response	
		Yes	No
1.	Flipbook is easy to use		
2.	Material is interesting and easy to understand		
3.	Flipbook makes IPAS learning more enjoyable and less boring		
4.	Flipbook increases my motivation to learn		
5.	Flipbook increases my interest in learning about changes to the Earth's surface		
6.	Language used is simple and easy to understand		
7.	Concept maps are easy to understand and illustrate the material flow		
8.	Material in each sub-chapter is clear and easy to understand		
9.	Images clarify content and provide new knowledge		
10.	I am able to learn independently using the flipbook		
11.	Flipbook can be used anywhere		

Source: Maisarah, 2021; Fitriyani, 2024.

Table 5. Blueprint of Pre-test and Post-test Questions

Learning Objective	Indicator	Question Number	Question Type
Students can explain the structure of the Earth's layers (lithosphere, hydrosphere, and atmosphere) and natural features on land and water.	Identify the name of the Earth's outermost layer	1	MCQ
	Explain the function of the atmosphere as Earth's protector	2	MCQ
	Mention the contents of the hydrosphere layer	3	MCQ
	Name examples of landforms	4	MCQ
	Analyze types of landforms based on their characteristics	5	MCQ
	Explain the function of the atmosphere for life	6	MCQ
	Explain the components of the lithosphere	7	MCQ
	Identify the process of landform formation	8	MCQ
	Explain the function of rivers as a landform	9	MCQ
	Mention the Earth's layer affecting weather and climate	10	MCQ
Students can analyze the water cycle and changes on the Earth's surface	Sequence the stages of the water cycle	11	MCQ
	Explain the process of evaporation	12	MCQ
	Explain the meaning of infiltration	13	MCQ
	Explain the process of cloud formation (condensation)	14	MCQ
	Analyze the relationship between the water cycle and soil erosion	15	MCQ
	Explain precipitation as part of the water cycle	16	MCQ
	Explain the benefits of the water cycle for life	17	MCQ

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

	Identify the negative impacts of water cycle disruption	18	MCQ
Students can retell the process of plate movement caused by convection currents in the Earth's mantle	Explain that the Earth's crust is the outermost layer	19	MCQ
	Identify the position and properties of the mantle	20	MCQ
	Mention the main composition of the Earth's outer core	21	MCQ
	Explain the properties and position of the inner core	22	MCQ
	Compare the properties of the outer (liquid) and inner (solid) core	23	MCQ
	Explain the role of convection currents in the mantle in driving plate movement	24	MCQ
	Arrange the Earth's layers from outermost to innermost	25	MCQ

Results and Discussion

Results

Based on the research and development process conducted, the following results were obtained regarding the developed product:

1) Analysis

The analysis stage was carried out through observation, interviews, and document study to identify problems in IPAS learning in grade V at SDN Tarokan 4, particularly on the topic of changes to the Earth's surface. This stage consisted of two sub-stages: performance analysis and needs analysis (Ningtyas *et al*., 2024). The performance analysis revealed that the learning process still relied heavily on printed books and worksheets, while available technological devices such as LCD projectors and laptops had not been optimally utilized. Teachers had not yet used digital media such as e-books or flipbooks, resulting in less engaging instruction and difficulties for students in understanding the material. The needs analysis, based on documentation of learning outcomes, showed that out of 41 students, only 13 (31.7%) achieved scores above the minimum mastery criteria. This indicates low learning outcomes, influenced by the lack of variety in teaching materials and insufficient use of technology in the learning process. Based on these findings, there is a need for the development of interactive and easily accessible digital teaching materials. Therefore, the researchers designed a flipbook teaching material using Canva and Heyzine Flipbooks applications. This flipbook was designed to be attractive, interactive, and accessible across various devices, supporting more effective and independent learning.

2) Design

In the design phase, the researchers developed a flipbook teaching material for the topic of changes to the Earth's surface for grade V at SDN Tarokan 4, with an engaging appearance. The development of the flipbook was carried out systematically, with the following steps: (1) Selection of Teaching Materials, (2) Selection of Format, (3) Identification of Learning Outcomes and Objectives, and (4) Initial Design. The initial design was created to organize the elements to be used prior to development, and was adjusted based on the analysis from the previous stage as well as the selected format.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Table 6. Flipbook Teaching Material Design

(a) Front Cover

(b) Concept maps

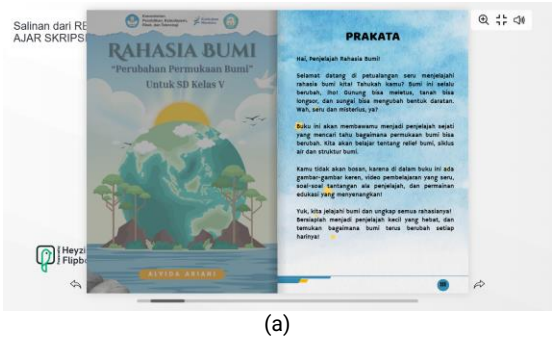
(c) Material

(d) Author Profile

3) Development

a. Final Product

The final product of the flipbook teaching material can be accessed and operated online via computer or smartphone. When accessed on a computer, the flipbook appears like a printed book with two pages that can be flipped left and right. On a smartphone, the pages are displayed one by one. The initial appearance of the flipbook when accessed online via computer/laptop and smartphone is shown below. The flipbook can be accessed at: https://heyzine.com/flip-book/fe723c0150.html



(a)

(b)

Figure 1. Initial display of the flipbook teaching material via (a) computer/laptop and (b) smartphone

b. Product Validity Test

The validity test of the flipbook teaching material was conducted by two experts: a subject matter expert and a media expert.

a) Material Expert Validation
The material expert validation focused on several aspects: content feasibility, presentation suitability, and language appropriateness. The material expert also provided comments and suggestions for improvement. The maximum possible score was 100, and the material expert gave a score of 100. The resulting percentage was 100%, which is categorized as "very valid." The validation by the material expert demonstrated that the teaching material met the required standards in terms of content, presentation, and language, and could be used without major revisions.

b) Media Expert Validation
The media expert validation focused on several aspects: screen design, ease of use, consistency, graphics, and benefits. The media expert also provided comments and suggestions for improvement. The maximum possible score was 100, and the media expert gave a score of 86. The resulting percentage was 86%, which is also categorized as "very valid." Thus, the teaching material can be used without major revisions.

c) Final Validation Results
The final validation result is the average score from both the material and media experts, as shown below:

Table 7. Final Validation Results from Material and Media Experts

No.	Aspect	Score
1.	Material Expert	100%
2.	Media Expert	86%
	Total Score	186%
	Average	93%

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Based on the validation results from both experts, the average validity score was 93%, which falls into the "very valid" category. Therefore, the developed teaching material is proven to be valid for use without further major revisions and is ready for broader trials.

4) Implementation

a. Product Practicality Test

The practicality test aimed to determine how easy the developed teaching material was to use. This was assessed through teacher and student response questionnaires.

1) Teacher Response Questionnaire
   The teacher response questionnaire was given to the grade V homeroom teacher at SDN Tarokan 4 to obtain suggestions and assess the practicality of the flipbook through a limited trial. The teacher's response score was 60, with a percentage of 100%, categorized as "very practical." The developed flipbook is practical and can be used without revision.
2) Student Response Questionnaire
   At this stage, students used the flipbook teaching material during learning activities and completed the practicality questionnaire. The average student response score was 82.5%, categorized as "very practical." It can be concluded that the developed flipbook teaching material is practical and can be used in wider trials.

b. Product Effectiveness Test

The effectiveness test of the flipbook was measured by students' learning outcomes before and after using the product, through pre-tests and post-tests. In this phase, a broader trial was conducted with 31 grade V students at SDN Tarokan 4, who took pre-tests and post-tests before and after using the flipbook. The average pre-test and post-test scores in the broad trial are shown below:

Table 8. Average Pre-Test and Post-Test Scores in Broad Trial

Aspect	Average	Percentage
Pre-test	61.29	61.29%
Post-test	91.10	91.10%

The increase in average pre-test and post-test scores in the broad trial is illustrated in the following diagram:

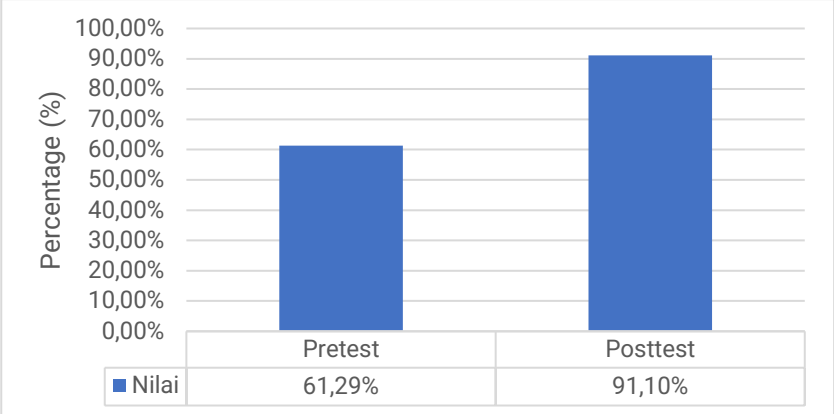


Figure 2. Diagram of Pre-test and Post-test Score Improvement

To determine the magnitude of the improvement between pre-test and post-test scores, an N-gain analysis was performed using IBM SPSS 25. The N-gain calculation results are presented below:

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Table 9. N-Gain Analysis Results in Broad Trial

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain	31	.56	.92	.7707	.09911
NgainPersen	31	55.56	91.67	77.0747	9.91139
Valid N (listwise)	31				

Based on the N-gain analysis table above, the average N-gain score was 77.07%, indicating that the flipbook teaching material on changes to the Earth's surface is "effective" in improving the learning outcomes of grade V students.

5) Evaluation

After the validation process by the material and media experts, the researchers revised several components of the flipbook teaching material based on feedback and suggestions from the validators. These revisions were made to improve the appearance, content, and functionality of the teaching material, making it more effective and better suited to the needs of the students.

Discussion

The flipbook teaching material developed in this study is a digital learning medium in the form of an interactive book that closely resembles the appearance of a printed book. This flipbook was specifically designed for fifth-grade elementary school students and covers the topic of changes to the Earth's surface in the IPAS subject. Its development refers to the learning outcomes of the Merdeka Curriculum and takes into account the characteristics of elementary school learners to ensure that the material is delivered in a more communicative, engaging, and easily understandable manner (Ulandari *et al*., 2023). The development process began with the visual design of content using Canva, chosen for its flexibility and comprehensive design features that support the creation of multimedia-based teaching materials (Martatiyana *et al*., 2022). The designed product was then converted into a flipbook format using Heyzine Flipbooks, resulting in an interactive display that mimics a physical book with responsive page-flipping features and cross-device accessibility. The structure of this teaching material consists of 36 pages, including the cover, preface, table of contents, concept map, main material, learning activities, interactive media (video, games, and audio), as well as evaluation and reflection. Features such as barcodes for accessing videos and external links are embedded as a form of integration between printed content and digital technology. This varied presentation aims to enhance student engagement and provide a holistic learning experience (Aliyah & Istiq'faroh, 2022).

However, the effectiveness of the product is not determined solely by the visual quality and content, but also by several other factors. First, internal factors such as the relevance of the material to students' needs, the completeness of learning features, and the interactivity of the content influence the extent to which students can understand and enjoy the teaching material. Second, external factors, such as the availability of digital devices, internet connectivity, and teachers' competence in utilizing educational technology, are key to the successful integration of the flipbook in the learning process (Talitha *et al*., 2023). In addition, students' motivation and digital literacy also play a significant role in determining the effectiveness of flipbook utilization.

Compared to previous studies, the findings of this research support those of Yulaika *et al*. (2020), which showed that electronic flipbooks can increase student participation and learning outcomes. This study also reinforces Utami (2023), who stated that flipbooks are highly valid and practical as differentiated teaching media. However, this research offers a different contribution in terms of focusing on the IPAS topic of changes to the Earth's surface, as well as the use of modern platforms such as Canva and Heyzine, which have not been widely adopted in previous studies. For further development, integrating flipbook teaching materials into Learning Management Systems (LMS) such as Google Classroom, Moodle, or other online applications is highly recommended. This integration aims to broaden distribution, accelerate teacher feedback, and improve the efficiency of student learning evaluation. Expanding the development to cover other IPAS topics, or even across subjects and grade levels, also holds significant potential to increase the impact of this innovation.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Conclusion and Further Research

Based on the results of development and testing, it can be concluded that the flipbook teaching material developed in this study meets the criteria of validity, practicality, and effectiveness. In terms of validity, expert validation by subject matter and media specialists indicated that the flipbook is highly valid, with an average score of 93%. This demonstrates that the content, design, and structure of the product align well with the required standards for quality instructional materials. Regarding practicality, both limited and broader trials showed a practicality rate of 100% from teachers and 82.5% from students, both classified as highly practical. These findings suggest that the flipbook is easy for teachers to use and well-received by students. In terms of effectiveness, the effectiveness test using the N-Gain calculation resulted in a score of 77.07%, which falls into the effective category. This indicates a significant improvement in student learning outcomes after using the flipbook during the learning process. Therefore, it can be concluded that the developed flipbook teaching material is feasible and effective for use in IPAS learning, particularly on the topic of changes to the Earth's surface for fifth-grade elementary school students. The findings of this study offer positive implications for the advancement of digital learning in elementary education. For teachers, interactive flipbooks can serve as an innovative, flexible, and engaging alternative teaching resource, thereby enhancing student participation and motivation. For schools, it is essential to provide adequate ICT infrastructure support, such as reliable internet connectivity and appropriate digital devices, to optimize the use of technology-based instructional materials. For future research, it is recommended that the development of flipbook teaching materials be equipped with automatic evaluation features, training modules for teachers, and adaptive modules to accommodate students with diverse abilities. Further studies could also involve testing across multiple schools and regions, as well as analyzing the impact of flipbook usage on other dimensions, such as students' critical thinking skills, collaboration, and digital literacy.

References

Aliyah, A., & Istiq'faroh, N. (2022). Pengembangan Media Flipbook Pada Pembelajaran Bahasa Indonesia Materi Fabel Pada Siswa Kelas Iv Sekolah Dasar. *Jurnal Muassis Pendidikan Dasar*, *1*(1), 1-9. https://doi.org/10.55732/jmpd.v1i1.3.

Arina, D., Mujiwati, E. S., & Kurnia, I. (2020). Pengembangan multimedia interaktif untuk pembelajaran volume bangun ruang di kelas V sekolah dasar. *Jurnal Ilmiah Kependidikan, 1*(2), 168–175.

Dewi, E. S. (2023). Pengembangan media pembelajaran berbasis flipbook pada materi struktur dan fungsi jaringan tumbuhan di SMA Negeri 1 Kota Gajah [Unpublished undergraduate thesis, Institut Agama Islam Negeri (IAIN) Metro]. https://repository.metrouniv.ac.id/id/eprint/8354/

Diki, S. A. A., Mukmin, B. A., & Wenda, D. D. N. (2022). Pengembangan bahan ajar booklet berbasis kontekstual pada materi sumber energi untuk siswa kelas IV sekolah dasar. *Jurnal Pendidikan dan Konseling, 4*.

Dwisa, S. O. M. (2022). Penggunaan media konkret untuk meningkatkan keaktifan belajar siswa pada kelas V SDN 078/I Teluk Ketapang [Thesis, Universitas Jambi].

Ghaniem, A. F., Rasa, A. A., Oktora, A. H., & Yasella, M. (2021). *Ilmu Pengetahuan Alam dan Sosial untuk SD kelas V*. Pusat Perbukuan Badan Standar, Kurikulum dan Asesmen Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.

Kemendikbudristek. (2022). *Capaian pembelajaran mata pelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS) Fase A – Fase C untuk SD/MI/Program Paket A*. Badan Standar, Kurikulum, dan Asesmen Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. https://kurikulum.kemdikbud.go.id/file/cp/dasmen/13.%20CP%20IPAS.pdf

Kosasih, E. (2021). *Pengembangan bahan ajar*. PT Bumi Aksara.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Luthfi, R. A., Sahari, S., & Wenda, D. D. N. (2022). Pengembangan Media Visual Tentara Pada Pembelajaran Ilmu Pengetahuan Alam bagi Siswa Sekolah Dasar. *AL-ASASIYYA: Journal Of Basic Education*, *7*(1), 46-57. http://dx.doi.org/10.24269/ajbe.v7i1.5700.

Maisarah, U. (2021). Pengembangan modul IPA berbasis etnosains Melayu pada materi pencemaran lingkungan dan dampaknya bagi ekosistem di kelas VII SMP Telekomunikasi Pekanbaru [Thesis, Universitas Islam Negeri Sultan Syarif Kasim Riau]. https://repository.uin-suska.ac.id/58394/

Martatiyana, D. R., Novita, L., & Purnamasari, R. (2022). Pengembangan bahan ajar flipbook manfaat energi kelas IV di sekolah dasar. *Muallimuna: Jurnal Madrasah Ibtidaiyah, 8*(1), 44–57.

Mualiffah, A. (2020). Pengembangan bahan ajar elektronik flipbook interaktif berbasis kearifan lokal sebagai sumber belajar muatan IPS siswa kelas V SDN 1 Wulung Blora [Thesis, Universitas Negeri Semarang].

Ningtiyas, E. S., WENDA, D. D. N., & WIGUNA, F. A. (2024). Pengembangan Multimedia Interaktif Sitaya (Sistem Tata Surya) Untuk Siswa Kelas 6 Di Sdn Kraton Kabupaten Kediri. *EDUTECH: Jurnal Inovasi Pendidikan Berbantuan Teknologi*, *4*(1), 46-59. https://doi.org/10.51878/edutech.v4i1.3018.

Nurdyansyah, N. (2018). Pengembangan bahan ajar modul ilmu pengetahuan alambagi siswa kelas iv sekolah dasar. *Universitas Muhammadiyah Sidoarjo*.

Nuryasana, E., & Desiningrum, N. (2020). Pengembangan bahan ajar strategi belajar mengajar untuk meningkatkan motivasi belajar mahasiswa. *Jurnal Inovasi Penelitian*, *1*(5), 967-974. https://doi.org/10.47492/jip.v1i5.177.

Prasetyono, R. N., & Hariyono, R. C. S. (2020). Development of flipbook using web learning to improve logical thinking ability in logic gate. *International Journal of Advanced Computer Science and Applications, 11*(1), 342–348. https://doi.org/10.14569/ijacsa.2020.0110143

Rachmawati, D. N., Kurnia, I., & Laila, A. (2023). Multimedia interaktif berbasis Articulate Storyline 3 sebagai alternatif media pembelajaran materi karakteristik geografis Indonesia di sekolah dasar. *Jurnal Pemikiran dan Pengembangan Sekolah Dasar, 11*(1), 106–121. https://doi.org/10.22219/jp2sd

Rini, D. R., Ratnawati, I., & Wulandari, R. T. (2021). The development of a flip book as an online learning media. *KnE Social Sciences*, 263–270. https://doi.org/10.18502/kss.v5i6.9209

Rohmah, D. A. N., Kurnia, I., & Wahyudi, W. (2024, August). Pengembangan Bahan Ajar Flipbook Pada Materi Gaya Untuk Meningkatkan Hasil Belajar Siswa Kelas IV SDN Gandu. In *Prosiding SEMDIKJAR (Seminar Nasional Pendidikan Dan Pembelajaran)* (Vol. 7, pp. 1208-1215).

Sa'diyah, K. (2021). Pengembagan e-modul berbasis digital flipbook untuk mempermudah pembelajaran jarak jauh di SMA. *Edukatif: Jurnal Ilmu Pendidikan*, *3*(4), 1298-1308.

Sari, D. A. P. P., & Kurnia, I. (2022). Upaya meningkatkan hasil belajar keragaman budaya Indonesia melalui TikTok pada kelas V sekolah dasar. *Jurnal Basicedu, 6*(5), 8285–8295. https://doi.org/10.31004/basicedu.v6i5.3686

Savera, A. R. (2023). Pengembangan bahan ajar pembelajaran matematika interaktif dalam bentuk e-modul dengan memanfaatkan aplikasi Canva dan Heyzine pada materi trigonometri kelas XI SMAN 1 Salatiga [Thesis, Universitas Sebelas Maret].

Sugiyono. (2017). *Metode penelitian kuantitatif, kualitatif dan R&D*. CV. Alfabeta.

Talitha, S., Rosdiana, R., & Mukhtar, R. H. (2023). Pengembangan bahan ajar digital flipbook dalam meningkatkan kompetensi guru MGMP Bahasa Indonesia SMA Kota Bogor. *SWARNA: Jurnal Pengabdian Kepada Masyarakat*, *2*(1), 169-177. https://doi.org/10.55681/swarna.v2i1.314.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 182-195

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4867

Ulandari, R., Syawaluddin, A., & Hartoto. (2023). Pengembangan bahan ajar flipbook berbasis teknologi informasi dan komunikasi (TIK) pada siswa sekolah dasar di Kabupaten Jeneponto. *Pinisi Journal of Education, 2*(5).

Utami, Y. R. (2023). Pengembangan bahan ajar berbasis flipbook dalam menunjang pembelajaran berdiferensiasi di kelas IV sekolah dasar [Thesis, Universitas Jambi]. https://repository.unja.ac.id/50517/

Utomo, L. A., Muslimin, M., & Darsikin, D. (2016). Pengembangan bahan ajar berbasis multimedia pembelajaran interaktif model borg and gall materi listrik dinamis kelas x sma negeri 1 marawola. *JPFT (Jurnal Pendidikan Fisika Tadulako Online)*, *4*(2), 16.

Vikiantika, A., Kurnia, I., & Rachmawati, D. N. (2021). Pengembangan media Siduwan (Siklus Hidup Hewan) berbasis Macromedia Flash di sekolah dasar. *Jurnal Basicedu, 5*(6), 5984–5994. https://doi.org/10.31004/basicedu.v5i6.1748

Wenda, D. D. N. (2016). Pengembangan bahan ajar multimedia untuk pembelajaran IPA SD. *Elementary School: Jurnal Pendidikan dan Pembelajaran Ke-SD-An, 3*(1).

Wenda, D. D. N., Imron, I. F., Putri, K. E., Sahari, S., Kurnia, I., Permana, E. P., Damariswara, R., Handayani, R., & Wiganata, S. A. (2023). Pelatihan pembuatan modul ajar sebagai upaya implementasi kurikulum merdeka pada guru SDN Jatirejo Kabupaten Kediri. *Jurnal Abdinus: Jurnal Pengabdian Nusantara, 7*(3), 848–855. https://doi.org/10.29407/ja.v7i3.21024

Widyasari, I. (2021). Pengembangan media pembelajaran matematika berbasis flipbook pada materi sistem persamaan linear dua variabel di kelas VIII SMP Negeri 5 Pekanbaru [Thesis, Universitas Islam Riau].

Yulaika, N. F., Harti, H., & Sakti, N. C. (2020). Pengembangan bahan ajar elektronik berbasis flip book untuk meningkatkan hasil belajar peserta didik. *JPEKA: Jurnal Pendidikan Ekonomi, Manajemen dan Keuangan, 4*(1), 67–76. https://doi.org/10.26740/jpeka.v4n1.p67-76