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Media Flipbook Based on Heyzine Application by Elementary School Teachers in Supporting Interactive Learning

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ABSTRACT: This study aims to analyze the quality of flipbook media created by elementary school teachers using the Heyzine application as a tool to support interactive learning. Using a qualitative approach and content analysis method, this research examines 10 flipbooks developed by teachers at SD Penggilingan 01 Jakarta. Data were collected through product analysis, interviews with teachers, principals, and students, as well as classroom observations. The findings reveal that most teachers were able to design flipbooks with clear structure, engaging visuals, and interactive features such as navigation buttons, audio, video, and animation. These media enhanced students' engagement and motivation in learning. However, several limitations were identified, especially in optimizing advanced features like animation and interactive quizzes. This study highlights the importance of continuous digital literacy training for teachers to fully utilize educational technology. The integration of teacher-created digital media like flipbooks represents a promising step toward learner-centered and interactive teaching practices in elementary education.

Keywords: flipbook, Heyzine, interactive learning, teacher-created media, elementary education.

ABSTRAK: *Penelitian ini bertujuan untuk menganalisis kualitas media flipbook yang dibuat oleh guru sekolah dasar dengan menggunakan aplikasi Heyzine sebagai alat untuk mendukung pembelajaran interaktif. Dengan menggunakan pendekatan kualitatif dan metode analisis konten, penelitian ini mengkaji 10 flipbook yang dikembangkan oleh guru di SD Penggilingan 01 Jakarta. Data dikumpulkan melalui analisis produk, wawancara dengan guru, kepala sekolah, dan siswa, serta observasi kelas. Hasil penelitian menunjukkan bahwa sebagian besar guru mampu merancang flipbook dengan struktur yang jelas, visual yang menarik, serta fitur interaktif seperti tombol navigasi, audio, video, dan animasi. Media ini meningkatkan keterlibatan dan motivasi belajar siswa. Namun, beberapa keterbatasan ditemukan, terutama dalam mengoptimalkan fitur lanjutan seperti animasi dan kuis interaktif. Penelitian ini menekankan pentingnya pelatihan literasi digital yang berkelanjutan bagi guru agar dapat memanfaatkan teknologi pendidikan secara maksimal. Integrasi media digital buatan guru seperti flipbook merupakan langkah menjanjikan menuju praktik pembelajaran yang berpusat pada peserta didik dan interaktif di pendidikan dasar.*

Kata kunci: *flipbook, Heyzine, media buatan guru, pembelajaran interaktif, pendidikan dasar.*

INTRODUCTION

Information and communication technology in the digital era has become an integral part of the educational world. The use of digital media in learning not

only increases student engagement but also allows for the delivery of more varied and interesting information. However, its utilization is still not evenly distributed across various education levels, particularly in elementary schools. Many teachers have not fully understood the potential of digital media or find it challenging to choose and implement technology that meets the learning needs (Shadiev & Wang, 2022). This condition is exacerbated by the limitations of teachers' abilities to choose the right digital media, develop relevant learning content, and effectively integrate these technologies into the teaching and learning process. This results in disparities in the quality of education and reduces opportunities for students to experience innovative and enjoyable learning experiences.

The lack of technology training, limited access to devices, and insufficient understanding of effective digital media utilization are the main obstacles often faced by teachers. As a result, teachers revert to conventional learning methods (Yuniastuti et al., 2021). This condition calls for innovative solutions that are not only easily accessible and usable by teachers but also capable of enhancing the quality of student learning experiences in the classroom. One solution is the use of interactive learning media in the form of flipbooks (Fatonah & Muzaki, 2024; Tirtawati, 2025; Wulandari et al., 2023)

A flipbook is a type of digital learning media that resembles a physical book but contains interactive elements. A flipbook can present information in an engaging way and allows users to flip pages with visual effects similar to a traditional book (Roemintoyo & Budiarto, 2021). Flipbooks are often used to present complex learning materials in a more appealing, easily understood manner, can facilitate enjoyable learning experiences (Hamidah & Asrohah, 2025; Prananda et al., 2025; Suyasa et al., 2021;), supports collaborative learning, encourages student cooperation (Nafiah & Wuryandani, 2024), and accommodates various student learning styles (Amelia et al., 2025; Mutiani et al., 2024; Purnomo et al., 2024).

This is the motivation for teachers at SD Penggilingan 01 Jakarta to continuously develop themselves. As one of the schools in East Jakarta that is responsive to technological advancements, this school began encouraging its teachers to utilize digital media in teaching. The goal is for teachers to improve the quality of the teaching and learning process in the classroom. For this reason, the school is quite active in involving teachers in various training related to technology, one of which is the creation of flipbook-based learning media using Heyzine.

The choice of the Heyzine application for making flipbooks is based on its ease of use, attractive appearance, attractive appearance, interactive features that support enjoyable learning (Rahmawati et al., 2025; Nainggolan & Rachman, 2024). This application allows teachers to convert educational materials, such as PDF files or images, into digital books that can be opened like physical books, complete with page-flipping effects. Additionally, Heyzine provides options to add multimedia elements such as videos, audio, and external links, which can enrich the educational content. With these various features, Heyzine is the right choice to help teachers create more engaging, easily accessible materials for students, and to enhance their involvement and understanding of the material presented.

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However, the quality of the flipbooks created by teachers needs further analysis to ensure they truly meet the learning objectives and characteristics of elementary school students. Based on initial observations, the flipbooks produced by teachers at Penggilingan 01 Elementary School in Jakarta still have various limitations, such as a less appealing visual presentation, material presentation that is not fully interactive, and suboptimal use of application features. Analyses can encompass various aspects such as the structure of the flipbook, the design of the flipbook, the content of the flipbook, the interactivity of the flipbook, language, as well as evaluation and reflection. This analysis also helps teachers identify areas that need improvement, both in terms of design and substance, ensuring that the media produced is not only visually appealing but also pedagogically strong. Thus, teachers are not only capable of creating digital media but can also ensure that such media enhances students' understanding and engagement during the teaching and learning process. This aligns with opinion (Fabre-Merchán et al., 2020), which emphasizes that the evaluation of educational technology products needs to be conducted comprehensively to understand the extent to which such media can create meaningful, engaging, and appropriate learning experiences for students.

Focusing on the products generated by teachers, this research aims to analyze the quality of flipbook media based on the Heyzine application in supporting interactive learning in elementary schools. The importance of interactive learning in the 21st century can encourage the development of critical thinking, collaboration, and creativity. Interactive learning can also help students develop social, communication skills, and motivation which are essential in an increasingly complex work environment (Jovanović & Chiong, 2014; Clark & Mayer, 2023). By using flipbooks, teachers can design learning activities that actively involve students, encouraging them to discuss and collaborate in understanding the material. This is particularly relevant in the context of elementary education, where students often require engaging learning media to maintain their attention and motivation.

The novelty of this research lies in its analytical focus on the digital media products created by teachers in primary education, particularly in the context of implementing the Heyzine application as an interactive teaching aid. Unlike previous studies that generally emphasize the development of flipbook media by researchers this study highlights the teachers' capabilities as independent creators of digital media. This research also expands the contribution to academic literature by using content analysis to examine key elements in flipbooks such as structure, design, interactivity, content accuracy, and language appropriateness, which have not been deeply studied in the context of teacher-made flipbooks. In comparison, research by (Serdyukov, 2017) emphasized the effectiveness of digital media on learning outcomes, while (Adiyono et al., 2024) stressed the importance of teacher involvement in educational innovation but did not analyze the concrete results of teachers' work directly. Thus, this research offers a new perspective on the potential of teachers in creating innovative learning media, as well as making a

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tangible contribution to strengthening digital competencies in the elementary school environment.

Through this analysis, it is hoped that researchers can identify various aspects and features of flipbooks to produce interactive learning. Therefore, research on the quality of Heyzine application-based flipbook media is expected to contribute to the development of more innovative teaching practices in elementary schools.

RESEARCH METHOD

This research was conducted using a qualitative approach and content analysis method. Content analysis aims to systematically organize and interpret the meaning of data, especially in visual communication materials and texts (Kleinheksel et al., 2020). Content analysis is used to examine the elements within flipbook media in depth, such as presentation structure, material content, visual quality, and the existence and function of interactive elements. This method not only focuses on the frequency of feature occurrence but also considers the context, meaning, and relationships between elements in the media product being analyzed. The analysis is based on the criteria for quality learning media and instructional design principles (Debattista, 2018).

The primary focus of the research is directed at various important elements that form the flipbook, including the structure or organization of the flipbook, visual design of the flipbook, interactive elements such as links, buttons, and multimedia, content or subject matter presented, and linguistic accuracy. This analysis is expected to provide a comprehensive overview of the strengths and weaknesses of flipbooks as interactive learning media.

Data and Data Sources

The main data in this study consists of ten flipbook products based on the Heyzine application created by teachers at the Penggilingan 01 Elementary School in Jakarta. These products are the focus of the content analysis in the study to evaluate the quality of structure, design, interactivity, learning content, and linguistic accuracy presented. In addition to the primary data, this research is also supported by supplementary data obtained through in-depth interviews with the principal, teachers, and students, as well as direct observations of the use of flipbooks in the classroom.

The data sources in this study include teachers who participated in training for creating flipbooks based on the Heyzine application, who have previously been trained to develop digital learning media independently. The information collected not only explains the media flipbook design process but also encompasses various technical and pedagogical challenges faced by teachers in integrating the media into teaching and learning activities. In addition, the effectiveness of flipbooks in supporting interactive learning is also examined through the responses of teachers and students, including the extent to which the media can enhance student engagement, understanding, and motivation to learn. With this approach, the

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research obtains a holistic view of the role of interactive flipbooks created by teachers in the context of learning at the elementary school level.

Data Collection Techniques

Data collection is conducted through documentation, interviews, and observation. Through documentation, researchers can review relevant documents related to the focus of the research. These documents may include writings, images, videos, recordings, or other objects that hold related information (Zhou et al., 2025). In this study, the documentation used consists of learning media created by teachers at SD Penggilingan 01 Jakarta in the form of Heyzine-based flipbooks. Each flipbook will be analyzed based on its organization and structure, design, content, interactivity, language, as well as evaluation and reflection.

Researchers also collect data using interview techniques, namely by directly asking questions to research subjects to obtain in-depth information (Salam, 2023). The informants interviewed in this study include the school principal, representatives of two teachers who have created Heyzine-based flipbook learning media, and students.

From the principal's perspective, the interview aims to understand the school's policies on the implementation of learning technology and the support given to teachers in developing digital media. Meanwhile, interviews with teachers focus on their experiences in using flipbooks, the benefits they feel, and the challenges they face in the teaching process. Interviews with students are conducted to explore their responses to the use of flipbooks, how much this media increases their engagement in learning, and which features are most helpful in understanding the material. By collecting perspectives from various parties, this research can provide a more comprehensive picture of the role of interactive flipbooks in creating a more engaging and effective learning experience. Another data collection technique is observation, which is the activity conducted by researchers to directly observe the behavior, situation, or conditions of research subjects in their natural environment (Karunarathna et al., 2024).

This observation aims to see how Heyzine-based flipbooks can be used in the learning process and students' responses to the media. The researcher acts as a participatory and passive observer. Participatory observation is conducted when the researcher accompanies teachers in creating Heyzine-based flipbook learning media. Meanwhile, passive observation is conducted when the representatives of the teachers implement the learning media in class.

Data Analysis Techniques

Data analysis is carried out by following the steps recommended by Miles and Huberman (In Satori & Komariah, 2017) which includes three stages: data reduction, data presentation, and conclusion drawing or verification.

The data reduction stage serves as a process to select, simplify, summarize, and factor data according to the research objectives. Data reduction is the initial step to filter and simplify the collected data to focus on relevant aspects. For example, after conducting interviews with the principal, teachers, and students, as

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well as classroom observations, the researcher gathers a lot of information regarding the use of flipbooks, interactive features used, challenges in implementation, and their impact on student engagement. From this data, the researcher then eliminates less relevant information, such as general opinions on educational technology that do not specifically discuss Heyzine-based flipbooks. Additionally, repetitive or insignificant data are filtered out to ensure a more directed analysis.

The next stage is data presentation. The data presentation process involves organizing a collection of information that helps the researcher see an overall picture or specific parts of the data being studied (Kumar & Praveenakumar, 2025). The reduced data is then analyzed and incorporated into an analysis table that has been created, referring to the structure and organization of the flipbook, design, interactivity, content/material, language, as well as evaluation and reflection according to the following analysis criteria.

Table 1. Criteria for Analyzing Flipbooks Based on the Heyzine Application

No.	Analysis Criteria	Completeness of Aspects
1.	Structure and Organization of the Flipbook	Cover (subject name, material title, class, and author's name)
		Opening section (learning objectives, brief overview of the material, and guide for using the flipbook)
		Closing section (conclusion, practice questions or quiz, and references)
		Navigation Buttons
2.	Flipbook Design	Color combination that supports readability
		High-quality images or illustrations that are balanced with text explanations
		Variations in font size and type.
3.	Content/Material of the Flipbook	Relevant to student needs
		Includes contextual examples or illustrations
4.	Interactivity of the Flipbook	Animation (page transition animations, illustration animations, text animations, interactive animations, and short video animations)
		Video (animated characters/ moving illustrations, human characters)
		Audio (automatic narration, additional sound effects, background music)
		Web links
5.	Language of the Flipbook	Clarity and readability
		Correctness of grammar and spelling
		Communicative

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6.	Evaluation and Reflection	Quiz
		Open-ended questions

The final stage is the conclusion or verification. Drawing conclusions is the last phase in the data analysis process. In this study, the process of drawing conclusions is conducted to seek an overview of the quality of the Heyzine-based flipbook learning media created by teachers at SD Penggilingan 01 Jakarta based on the research instruments. The results are then reviewed to obtain valid data.

The coding technique in this study was carried out through three main stages: open coding, axial coding, and selective coding (Creswell & Poth, 2018). In the open coding stage, the researcher read and analyzed all data from interviews, observations, and flipbook product analyses to identify keywords, phrases, or statements relevant to the research focus. Next, in the axial coding stage, the researcher grouped those codes into broader categories based on the meaning connections, such as aspects of visual design, interactivity, material suitability, and the utilization of the Heyzine application features. In the final stage, selective coding, the researcher selected the core categories that most represent the phenomenon being studied and organized them into interconnected research themes. This coding process was conducted iteratively and triangulatively to obtain valid, consistent, and scientifically accountable findings.

The validity of the data in this study is ensured through technique triangulation, findings verification by peers (peer debriefing), and audit trails. Although the research uses content analysis methods on the digital flipbook produced by teachers, triangulation is carried out by complementing the data through interviews and observations of the media's usage context. The validity of the categories is also ensured by developing analysis indicators based on media learning theories and instructional design. The entire process is analyzed carefully and systematically to maintain the objectivity and reliability of the research results.

RESULT AND DISCUSSION

This section will explain the results of the analysis of ten flipbooks created by teachers at SDN Penggilingan 01 Jakarta. The analyzed flipbooks are products of the interactive flipbook learning media creation training conducted by teachers at the school. This analysis includes several main aspects, such as the flipbook structure, design, content, interactivity, language, and evaluation and reflection.

Flipbook Structure

The completeness of the flipbook section is a primary aspect in assessing the quality of the flipbook. This completeness includes the cover, introductory section, discussion or content, and conclusion. The first analysis is related to the flipbook cover. The cover can determine whether students will be interested in continuing to read the flipbook or not.

The analysis results indicate that the cover design of the flipbooks created by the teachers at SDN Penggilingan 01 Jakarta is attractive and successfully

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combines various colors and appropriate images. However, not all covers include the complete subject name, material title, grade, and author name. There are 6 flipbooks that include the complete cover section, 3 flipbooks that do not include the subject name, 2 flipbooks that do not list the grade, and 1 flipbook that does not list the author name. Based on the analysis results, it can be concluded that the incompleteness of the cover section is dominated by the absence of the subject name.

The next analysis concerns the completeness of the flipbook's introductory section. This part serves as an introduction that helps readers understand the goals and content of the flipbook. It aims to capture the reader's attention and provide initial orientation before delving into the core content. Some aspects focused on in the analysis include learning goals or outcomes, a general overview of the material, and a guide for using the flipbook.

The analysis results indicate that all flipbooks have included learning objectives and a general overview of the material. However, regarding the flipbook guide, there are 5 flipbooks that have not included this guidance. This guide could assist students in understanding how to use the flipbook effectively. By understanding the guide, students can learn independently, stay more focused, and be more active and enthusiastic in following the digital learning process.

Concerning the discussion or content, the teachers have presented the material systematically. A systematic presentation allows students to understand concepts step by step, starting from simple information to more complex levels. Additionally, the material presented is aligned with the learning objectives.

The analysis of the conclusion section pertains to the presence of a summary, exercise questions or quizzes, and references. The flipbooks created by the teachers include summaries and exercise questions or quizzes. However, only 5 flipbooks included references at the end. References play a crucial role in enhancing the credibility of the material presented and providing a strong scientific foundation. With references, teachers can ensure that the material taught has a valid and accurate basis. The completeness of the analysis related to the structure of the flipbooks is presented in the following table.

Table 2. Analysis of Structure and Organization of Flipbooks

Flipbook	**Cover**				**Opening**			**Closing**		
	S	TM	G	AN	LO	MO	FG	S	Q	R
1	√	√	√	√	√	√	√	√	√	√
2	√	√	√	-	√	√	√	√	√	√
3	√	√	√	√	√	√	√	√	√	√
4	√	√	√	√	√	√	√	√	√	√
5	√	√	√	√	√	√	-	√	√	-
6	-	√	-	√	√	√	√	√	√	-
7	√	√	√	√	√	√	-	√	√	-
8	√	√	√	√	√	√	-	√	√	√
9	-	√	√	√	√	√	-	-	√	-
10	-	√	-	√	√	√	-	-	-	-

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Cover Information	Opening Information LO:	Closing Information
S: Subject	Learning Objectives	S: Summary
TM: Title of Material	MO: Material Overview	Q: Quiz
G: Grade	FG: Flipbook Guide	R: References
AN: Author Name		

Flipbook Design

The design of the flipbook includes a combination of colors that support readability, high-quality images or illustrations balanced with text explanations, and variations in font size and type. With appropriate color design and illustrations, the flipbook serves not only as an information medium but also as a visual aid that reinforces conceptual understanding.

Based on the analysis results, all flipbooks created by teachers at SDN Penggilingan 01 Jakarta have used high-quality images that are neither pixelated nor blurry, thus supporting readability and student comprehension of the material. Clear and sharp images enable students to observe details better, especially when the material presented is visual in nature, such as scientific processes or concepts of spatial shapes. Below is an example of a flipbook design created by one of the teachers at the school.

Figure 1. Example of Flipbook Design (Creator: Rizken Gifari)

The selection of images in the flipbook also needs to complement the text as an informational explanation so that both work together to convey learning messages. This suitability helps clarify the material, making it easier for students to understand concepts and reducing the potential for confusion. These findings align with the principles of multimedia learning that emphasize the importance of integrating text and images for effective message delivery and maintaining students' cognitive load.

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Although, overall, the images presented in the flipbook are of good quality, there are 3 flipbooks that lack balance between images and text, such as having too many images without adequate explanations or, conversely, text that is too dense with few supporting illustrations. Therefore, improvements are needed in the arrangement of images and text to make the flipbook more interesting and clear in conveying information.

The next analysis pertains to the varied size and type of fonts used. The analysis results indicate that all flipbooks have utilized a variety of font sizes and types. With the right color combinations, high-quality images, and varied font sizes and types, the flipbooks created by the teachers at the school have met good design standards for educational media. A design that takes into account readability and aesthetics will enhance student engagement in the learning process.

Flipbook Material Content

The selection of materials in the flipbook must be tailored to the age of elementary school students, as cognitive, language, and comprehension abilities vary at different age levels. Several aspects that need to be considered regarding the content of the flipbook include that the materials must be relevant to students' needs and include examples or illustrations to facilitate students' understanding.

Based on the analysis results, the materials created by the teachers at Sekolah Dasar Penggilingan 01 Jakarta are already in line with the needs of the students at that school. The teachers have adjusted the materials in the flipbook to match the discussions found in the textbooks and the daily experiences of the students.

The inclusion of contextual examples or illustrations is also very important in helping students connect materials with real experiences, making it easier for them to understand the concepts being taught. For instance, when the teacher explains the material about human senses, they can use a short illustration of a child seeing various flowers and birds in the park on a sunny morning. Another example is when discussing etiquette at home; the teacher can relate it to how students should behave towards their parents and siblings, table manners, and speaking etiquette.

Interactivity of the Flipbook

The interactive features of the flipbook include navigation buttons, animations, videos, audio, and web links. All flipbooks created by teachers have been equipped with navigation buttons that facilitate users in quickly and intuitively moving between pages. The existence of this feature does not merely replace the function of printed books (substitution) but also enhances the reading experience by modifying the way students access and explore material in a more interactive manner (augmentation), in accordance with the stages in the SAMR model.

The interactive features of the flipbook include navigation buttons, animations, videos, audio, and web links. All the flipbooks created by the teachers

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already have navigation buttons that facilitate easy page turning for the users. This enhances the user experience in reading and exploring the contents of the flipbook in a more interactive manner.

The animation features consist of various forms, such as page transition animations, illustration animations, text animations, interactive animations, and short video animations. The analysis results indicate that 4 flipbooks include all types of animations, 1 flipbook includes 4 types of animations, 3 flipbooks include 3 types, 1 flipbook includes 2 types, and 1 flipbook includes 1 type of animation. The following is a table analyzing the use of animations in the flipbook.

Table 3. Analysis Results of Animation Usage in Flipbooks

Flipbook	Page Transition Animation	Illustration Animation (Image)	Text Animation	Interactive Animation	Short Video Animation
1	√	√	√	√	√
2	√	√	√	√	√
3	√	√	-	√	√
4	√	-	-	-	-
5	√	√	√	√	√
6	√	√	√	√	√
7	√	√	-	√	-
8	√	√	-	√	-
9	√	√	√	-	-
10	√	√	-	-	-

The table illustrates that the most commonly used animation is the page transition, which features a realistic page-turning effect. Another frequently used animation is the illustration or moving image animation and the interactive animation, which includes elements that respond when clicked or touched. The presence of these animation features makes the flipbook more dynamic and helps students understand the material in a more visual and enjoyable way.

Regarding videos, all teachers have included this feature in the flipbook, utilizing various characters such as cartoons and humans or animations and real images. The video feature aims to provide a multisensory experience that allows students to see and hear explanations simultaneously for a somewhat extended duration. For example, the teacher can show a short YouTube video about plants reproducing generatively.

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Figure 2. Use of Video Feature in Flipbook (Creator: Septiani)

The analysis results concerning the use of audio features indicate that only 4 flipbooks utilize audio in the form of background music, while 6 other flipbooks do not use this feature. Background music in the flipbook can help build emotions and atmospheres that match the content, such as cheerful music for fable stories or calming music for science materials. With the right combination of visuals, text, and background music, interactive flipbooks can create a more immersive and effective learning experience for elementary school students.

Another interactive feature that teachers can utilize when creating flipbooks is web links. This feature provides students with broader access to explore the material in greater depth. The analysis results indicate that all the flipbooks made have utilized this feature as a complement to the materials. The links lead to interactive simulations and online quizzes or exercises.

Language in the Flipbook

Language plays an important role in determining the extent to which students can understand the information presented in a flipbook. Several criteria related to language in the flipbook include: 1) clarity and readability, 2) grammatical accuracy and spelling, and 3) communicativeness.

The results of the analysis indicate that the overall flipbook meets the aspects of clarity and readability. The use of simple words and relatively short sentences allows students to comprehend the material without feeling burdened. For lower-grade classes, teachers utilize a concise delivery style to enhance student focus, especially for those who are still in the early stages of reading and understanding written information. For instance, in a flipbook intended for first graders on the topic of “Senses,” a teacher might write the sentences "I see with my eyes. I hear with my ears." These simple sentences directly explain the functions of the senses without needing additional complex sentences.

The subsequent linguistic analysis relates to grammatical accuracy and spelling. Generally, teachers have been able to apply grammar well. This is

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evidenced by the clear and complete structure of the sentences. However, in terms of spelling, there are a few sentences where the spelling is not consistent, particularly regarding the use of capital letters, choice of words, and punctuation. Nevertheless, these sentences do not diminish the meaning or information conveyed in the flipbook.

Regarding the use of communicative language, the overall flipbooks created have considered this aspect. Teachers have adjusted the language in the flipbook to match child-friendly speech, employing various text formats such as dialogues, reflective questions, everyday experiences of children, or invitations for interaction. Overall, the 10 flipbooks produced by the teachers of SDN Penggilingan 01 Jakarta have met the language standards suitable for elementary school students. The accuracy and appropriateness of language use make the flipbook an engaging learning medium that helps students understand the material more quickly and enjoyably.

Evaluation and Reflection

Evaluation in learning is crucial for assessing students' understanding of the material that has been taught. The analysis results indicate that all flipbooks have provided interactive quizzes or exercises as evaluation materials. The interactive quizzes are presented in the form of barcodes that can be scanned or link URLs that, when clicked, will direct students to Quizizz or Wordwall websites.

In addition to evaluations, reflections or open-ended questions also play a significant role in fostering critical thinking and analytical skills among students. Unfortunately, only three flipbooks included elements of reflection or open-ended questions. For example, in the subject of IPAS for fourth grade on the topic of Plants, a teacher posed the open question, “What would happen if there were no plants in this world?” Through this question, students can explore various possibilities arising from the absence of plants on Earth, such as its impact on living beings, environmental changes, and ecosystem balance. This open-ended question can also serve as an interesting discussion topic in learning, allowing students to share opinions and learn from their peers' perspectives.

Based on the formative evaluation results conducted at the end of the learning process, the Heyzine-based flipbook used by teachers showed an improvement in student achievement in the areas of concept understanding and class participation. Quantitative data obtained from learning outcome tests indicated that the average student score rose from 72.4 in the pre-learning phase to 82.1 after using the flipbook. Additionally, observation notes indicated an increase in student engagement, reflected in their more active participation in asking questions, responding, and completing tasks based on the flipbook material.

The majority of students stated that the flipbook helped them understand the material due to its engaging presentation, the use of bright colors, and the presence of animations and videos that clarified explanations. Some students even expressed that learning became more enjoyable and less boring compared to conventional methods. However, there were also suggestions from some students

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who found it difficult to read the text if the font was too small or if the pages were too dense with information. These findings indicate that although the flipbook media has a positive impact on student understanding and motivation, adjustments are needed in the design aspects to better accommodate the needs and characteristics of elementary school students.

Discussion

Based on the analysis of the 10 flipbooks developed by teachers at Sekolah Dasar Penggilingan 01 Jakarta, it was found that most teachers were able to systematically and logically organize the structure of the flipbooks. Each page of the flipbook exhibits a well-organized flow of material, starting from the introduction, core presentation, to simple evaluations. Teachers have also successfully incorporated interactive elements such as navigation buttons, explanatory audio, educational videos, and even external links that support material enrichment. The content presented is generally tailored to the basic competencies and learning objectives outlined in the curriculum, complete with engaging visual illustrations. This data was obtained through content analysis based on predetermined analysis criteria.

These findings are supported by interview data and direct classroom observations, which show that teachers deliberately consider pedagogical and aesthetic elements when designing the flipbooks. Some teachers reported that they designed this media with students' learning interests and differentiation needs in mind, such as using brightly colored images, easy-to-read fonts, and language that is communicative and aligns with the cognitive development levels of elementary school students. This aligns with the findings of Lu & Hanim (2024) that emphasize the coherence between content, visual design, and interactive elements in digital media significantly influences learning effectiveness. Meanwhile, according to (Ali, 2025), the quality of structure and visuals in digital teaching media plays a crucial role in shaping emotional and cognitive engagement.

Teachers' ability to produce flipbooks that meet pedagogical and aesthetic standards is an important achievement in the context of technology-based learning innovation. Furthermore, the principles applied by teachers are in line with Mayer's Cognitive Theory of Multimedia Learning, which emphasizes the importance of combining text and images (multimedia), placing text and images closely together (contiguity), and breaking down material into more easily comprehensible sections (segmenting) (Clark & Mayer, 2023). The application of these principles in creating flipbooks has the potential to reduce students' cognitive load, enhance focus on important information, and strengthen conceptual understanding through the appropriate combination of visual and audio elements.

Although most teachers have successfully integrated various features in flipbooks, the analysis results also indicate that there are still limitations in optimizing advanced features, especially in the animation section. Some teachers stated that they have not fully understood how to insert automatic interactive

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animations (such as GIFs or Lottie animations), and they are also unaware of how these animations can be used to enhance visual concept understanding. As a result, some flipbooks only utilize basic features such as navigation, text, and video, while the visualization potential through animation has not been maximized.

These limitations can be understood considering that teachers' mastery of digital technology varies significantly, depending on their backgrounds, training attended, and the availability of time to explore the platform's features. According to Shao et al. (2022), many teachers experience a digital skill gap in designing learning media, especially regarding the use of more complex multimedia features. A similar observation was made by Agbor et al., (2025), who emphasized that although teachers are willing to innovate, technical limitations and a lack of practical-based training often become major obstacles in the optimal implementation of learning technology. Therefore, further training that focuses more on interactive features such as animation, transitions, and dynamic visual elements is crucial to improve the quality of flipbooks as comprehensive interactive learning media.

These explanations simultaneously provide evidence that flipbook creation training can empower teachers to act not only as educators but also as digital learning media designers. This is reinforced by Fabre-Merchán et al., (2020) who stated that in 21st-century learning, teachers are expected to facilitate interactive and multimodal learning experiences. From classroom observations, the use of flipbook media based on the Heyzine application has been proven to encourage active student engagement in the learning process. Student interaction significantly increased, especially when they interacted with moving animation features and short videos embedded in the flipbook. Students were not just passively listening to the teacher but were actively pressing buttons, selecting pages, and watching videos relevant to the material. This shows that flipbook media can provide a more responsive learning experience, with students directly involved in navigating and exploring the material. Compared to conventional methods based on printed textbooks, which tend to be one-directional and monotonous, learning with flipbooks creates a more dynamic, participatory, and enjoyable classroom atmosphere.

Student enthusiasm is also evident in their facial expressions, active responses to questions, and their initiative to discuss the content displayed on the screen. Teachers reported that students became more focused and found it easier to understand material when supported by attractive visual and audiovisual presentations. This aligns with the active learning concept proposed by Hamidah & Asrohah (2025), which explains that student participation in the learning process increases when they are directly involved in activities that require critical thinking, exploration, and reflection. Therefore, well-designed flipbooks not only enrich learning content but also foster the formation of two-way interaction between students and the material, which is the essence of interactive learning.

Interactive digital learning media, such as flipbooks that combine visual and multimedia elements, can enhance students' attention, engagement, and

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motivation to learn (Bunari et al., 2024). Interactivity allows students to be active participants in the learning process, rather than mere information recipients. According to El-Sabagh (2021), learning that involves responsive visual and audiovisual media provides a more personal, engaging, and adaptive learning experience to meet students' needs. Thus, the use of interactive flipbooks can be seen as one effective strategy in creating meaningful learning that engages various student learning styles.

When viewed through the SAMR model (Substitution, Augmentation, Modification, Redefinition), the use of flipbooks can be at the Modification or even Redefinition stage. At the Modification stage, flipbooks not only replace print media with a digital version but also modify the learning experience with interactive features such as links, videos, and animations (Amelia et al., 2025). Meanwhile, at the Redefinition stage, flipbooks allow for the creation of learning experiences that were previously difficult or even impossible to achieve with traditional media, such as integrating interactive quizzes and live simulations within the flipbook pages.

This research finding supports previous research by Endaryati et al., (2023), which showed that the use of flipbook media can enhance the effectiveness of thematic learning in elementary schools. The flipbooks created by the teachers at SD Penggilingan 01 have considered pedagogical and aesthetic elements in their design, positively impacting student engagement and understanding. This finding aligns with the research by Hamidah & Asrohah (2025),which emphasizes that the integration of content, visual design, and interactivity are critical factors determining the effectiveness of digital media in learning. However, this finding differs from the study conducted by Suyasa et al., (2021), which found that most elementary school teachers have not optimally utilized the potential of digital media due to limitations in technology literacy and a lack of training support. This difference indicates that the quality of digital learning media is significantly influenced by teachers' digital literacy levels, access to training, and school infrastructure support.

The uniqueness of this research lies in the direct involvement of teachers as media creators, not just users. This aligns with the teacher-driven innovation approach highlighted by Yendol-Hoppey et al., (2018), emphasizing the importance of teacher-practice-based innovation.

Based on these findings, modifications can be proposed to the technology-based learning design theory, which has traditionally placed teachers primarily as media users. Traditional models such as ASSURE or ADDIE can be adjusted by adding a phase for teachers as media developers, emphasizing the process of content creation by teachers using simple digital platforms like Heyzine. This also strengthens the need for a new framework that combines pedagogical, technological, and creative competencies (TPACK) in teacher training schemes, as suggested by Shafie et al., (2019). In this context, teachers are required not only to master the subject matter (content knowledge) but also to understand effective learning strategies (pedagogical knowledge) and the ability to optimally utilize technology like Heyzine (technological knowledge). Flipbooks designed with

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consideration for these three aspects will be able to present relevant, easily understood, and engaging material for elementary school students.

The implications for the curriculum include the need to integrate digital media design skills into teachers' professional development programs, whether through competency-based training or direct mentoring in schools. The pre-service teacher education curriculum also needs to include competencies for developing interactive digital media, including the use of applications like Heyzine, so that graduates are prepared to face the demands of 21st-century learning. From a policy perspective, the education department could consider establishing guidelines for the use of digital media that regulate pedagogical, aesthetic, and technical standards for interactive media. Such policies would not only encourage equitable quality in technology-based learning but also ensure that the use of digital media, including flipbooks, align with national curriculum goals and support the achievements of the Pancasila Student Profile. Therefore, the theoretical contribution of this research is the proposal to enhance the dimension of teacher creativity in the practice of designing interactive digital media based on easily accessible platforms.

CONCLUSION

This research shows that the flipbook media based on the Heyzine application, developed by teachers at SD Penggilingan 01 Jakarta, is capable of supporting interactive learning. Based on the analysis of 10 flipbooks and additional data from interviews and observations, it was found that the teachers have successfully designed digital learning media that features a coherent structure, attractive visual design, and includes interactive elements such as links, animations, audio, and video. This media not only reinforces the delivery of material but also enhances student engagement and motivation in the classroom. The flipbooks developed provide a more dynamic and responsive learning atmosphere compared to conventional methods, as students can interact directly with the multimedia content presented.

The direct involvement of teachers in the media design process also indicates an increase in digital literacy and pedagogical creativity, which are crucial in addressing the challenges of 21st-century learning. Thus, the use of Heyzine-based flipbooks not only serves as an auxiliary teaching medium but also acts as a means of transforming the role of teachers into facilitators of more contextual and meaningful interactive learning for elementary school students.

However, there are still some limitations faced by teachers in the design and development process of the flipbooks. One of the main limitations is the suboptimal use of advanced features in the Heyzine application, such as complex animations, integration of interactive quizzes, or smooth transition settings. Some teachers report only using basic features due to limited technical knowledge and time to explore the application thoroughly. Additionally, not all teachers have a background in design or experience using digital media, which results in some flipbooks being inconsistent in terms of aesthetics and the color or font choices that are less appropriate for the age characteristics of the students. These findings

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suggest that although teachers' digital competencies have developed, further in-depth and continuous training is needed to support the optimal utilization of flipbook media as interactive learning tools..

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