

# Development of healthy environment science flipbook media based on the wisdom of class V elementary school students in sarang district

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## To Cite This Article:

Nugroho, G. A., Ismaya, E. A., and Khamdun (2026). Development of healthy environment science flipbook media based on the wisdom of class V elementary school students in sarang district. *ICCCM Journal of Social Sciences and Humanities*, 5(3). 87-91. <https://doi.org/10.53797/icccmjssh.v5i3.14.2026>

**Abstract:** Based on the mid-semester summative scores, there are still several students who have not achieved completeness in the specified KKM. The learning content with the lowest value is the science learning content. In this learning content, there are 60% of students who have not reached the KKM, while the other 40% of students have reached the KKM. This data was taken from the Mid-Semester II Class V Summative Assessment scores in semester 2 of the 2023/2024 school year at SD Negeri Gilis. The research method used is research and development (R&D). The subjects of this research were teachers and students of class V at a State Elementary School in Sarang District, Rembang Regency. This development research was carried out through several stages of the ADDIE development model. Data collection uses observation, questionnaires, interviews, documents and tests. Data analysis techniques use initial data analysis, hypothesis testing and n-gain testing. The results showed an increase in n-gain; assessment of material experts in the appropriate category and media experts in the appropriate category; and it is hoped that there will be an increase in cognitive learning outcomes from the average pre-test and average post-test.

**Keywords:** Learning Outcomes; Flipbook; Healthy Environment

## 1. Introductions

The concept of "Freedom of Learning" actually does not determine the direction of educational goals in our country. However, the concept of independent learning contributes to improving students' competencies and learning independence in facing current educational challenges (Nafrin & Hudaidah, 2021). The use of technology and the need for competency in the current era are among the foundations for curriculum development. The increasingly massive use of technology and various government programs such as Mobilizing Schools, Mobilizing Teachers, and Vocational School Centers of Excellence (SMK-PK) are efforts made by the government in implementing the Merdeka Curriculum to recover from the learning crisis (Oktaviani & Lestari, 2023).

One factor that influences the quality of teaching is the teacher. Teachers have a dominant role in the learning process because they act as facilitators and managers of classroom learning activities. In addition, the use of innovative and interactive learning media also plays an important role in improving student engagement and learning outcomes (Novella & Rahman, 2024). Based on pre-research activities through observations and interviews conducted by researchers at Gilis State Elementary School, several problems were found regarding the limited use of learning media, which caused low student motivation and affected learning outcomes.

As a result, several fifth-grade students obtained scores below the Minimum Completeness Criteria (KKM) in science learning content. Through interviews, teachers stated that students were less enthusiastic about lecture-based learning methods and showed greater interest when learning media were used during classroom activities. However, teachers experienced limitations in providing innovative learning media. After observing and analyzing student learning outcomes during the Mid-Semester II Summative Assessment, researchers found that many fifth-grade students had not yet achieved the expected KKM standards. Previous studies also revealed that flipbook-based digital learning media can improve student motivation and learning outcomes in elementary schools (Juliani & Suryani, 2023; Nurhamidah et al., 2023).

## 1.1 Conceptual framework

Flipbook media has several advantages compared to conventional learning media because it not only presents text, but also integrates multimedia elements such as animations, videos, audio, and interactive features. Digital flipbooks are categorized as audio-visual learning media that can increase student engagement and understanding during the learning process (Azizah & Sukardi, 2024; Aprilia et al., 2024). The development of digital technology has also encouraged the transformation of learning media into more interactive and flexible forms that support modern educational needs.

A flipbook is a digital learning medium designed to simulate the experience of reading a physical book on a computer or mobile screen. The pages can be opened and flipped digitally, creating a more attractive and interactive learning atmosphere. Initially, flipbooks were used only for animation displays, but currently they have been widely adopted in digital educational applications such as e-books, digital comics, magazines, and interactive learning modules (Ramadanti & Bektiningsih, 2023). The multimedia features available in flipbooks allow students to access learning materials more effectively through visual and audio support.

Therefore, digital flipbooks can be defined as systematically arranged digital learning media containing text, images, videos, animations, and audio presented in an interactive format to improve student participation and learning experiences. The use of flipbook-based media has been proven to increase students' interest, motivation, and learning outcomes in elementary schools (Fia et al., 2023).

Several previous studies support the use of flipbook media in improving learning outcomes. Research conducted by Juliani and Suryani (2023) entitled *The Effect of Flipbook Learning Media on Science Learning Outcomes of Elementary School Students* showed that flipbook media had a significant effect on students' science learning outcomes. The results of the t-test analysis showed a significance value of  $0.000 < 0.05$ , indicating that  $H_0$  was rejected and  $H_1$  was accepted. This finding proves that the use of flipbook media can positively improve science learning outcomes among fifth-grade elementary school students.

## 1.2 Research objectives

This research was carried out at Sarang District Elementary School, Rembang Regency, specifically at Gilis State Elementary School, Jambangan State Elementary School, Lodanwetan 01 State Elementary School and Dadapmulyo State Elementary School.

## 2. Methodology

### 2.1 Research design

The research procedure uses research and development methods with the ADDIE development model.

### 2.2 Respondents of the study

Data from students was obtained through direct observation and interviews. Data about student attitudes and behavior, student evaluation results were obtained by interviews with class teachers, and direct observation was also carried out to observe student activities. Student data is also supported by documentation data in the form of student learning outcomes.

## 3. Findings and discussion

The following are the results of the data.

### 3.1 Knowledge

This study is categorized as Research and Development (R&D) research. The media developed in this study is flipbook-based learning media on healthy environmental materials for fifth-grade elementary school students in Sarang District. In this research, the researchers applied the ADDIE development model, which consists of five stages: analysis, design, development, implementation, and evaluation (Salma & Hidayati, 2023).

The results of this study include product design, product development, product trials, and data analysis. The product design stage includes the analysis and design phases of the ADDIE model, while the product development stage focuses on the creation of flipbook-based learning media. The implementation stage consists of product trials conducted in the classroom, and the evaluation stage analyzes the effectiveness of the developed media in improving students' cognitive learning outcomes in science learning materials related to healthy environments.

After completing the material and media expert validation stages, the next step was conducting training sessions for classroom teachers regarding the use of flipbook-based learning media. This training was necessary because teachers acted as the implementers of the learning process in the classroom. Through the training activities, teachers were expected to understand the functions and operational procedures of the developed flipbook media more effectively (Amalia & Junaedi, 2024).

The training activities provided to teachers included direct practice in using flipbook media. Teachers were first introduced to the concept and functions of flipbooks, followed by practical guidance on how to access and use the media during classroom learning activities. The training materials included: (1) introducing flipbook media; (2) guiding teachers in accessing the flipbook website; (3) introducing flipbook features; (4) explaining learning materials in the flipbook; (5) guiding teachers in managing quizzes and evaluation activities; (6) introducing learning videos integrated into the flipbook; and (7) explaining the use of evaluation tests provided in the media.

The development of flipbook-based e-learning media was adjusted to the needs of teachers and students. Data regarding teachers' and students' needs were obtained through interviews and questionnaires. The interview results showed positive responses from teachers toward the development of flipbook-based e-learning media. Fifth-grade teachers stated that students were more enthusiastic when learning activities used computers and internet-based media. In addition, the use of interactive media made learning activities more interesting and enjoyable for students (Situmorang et al., 2020). Previous studies also reported that flipbook-based digital media can increase student motivation, participation, and learning outcomes because of their attractive visual displays, animations, and multimedia features (Fia et al., 2023; Sudiarti et al., 2023; Tirtawati et al., 2025).

### 3.2 Sample of a figure is as below

The results of the normality test are used to find out whether the student score data on the pretest and posttest are normally distributed. Normality test using SPSS software. In the normality test, data can be declared to be normally distributed if it is significant more than 0.05 ( $sig > 0.05$ ). If the significance is less than 0.05 then the data is declared abnormal.

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Pretest	.146	35	.056	.949	35	.104
Posttest	.127	35	.170	.953	35	.139

a. Lilliefors Significance Correction

Fig. 1

Based on this table, it can be concluded that the pretest and posttest scores are normally distributed. Because  $sig > 0.05$ , namely pretest 0.104 and posttest 0.139. The value data was then tested by t-test using the SPSS program.

Hypothesis testing uses the t-test, namely if the calculated t is smaller than the t table, then  $H_a$  is rejected. If t calculated is greater than t table then  $H_a$  is accepted. If calculated based on significance then if  $sig > 0.05$  then  $H_0$  is accepted and if  $sig < 0.05$  then  $H_0$  is rejected.  $H_0$  = There is no difference in class V science and science learning outcomes before and after using flipbook-based learning media.

$H_a$  = There is a difference in class V science and science learning outcomes before and after using flipbook-based learning media.

The results of the t-test paired sample test are as follows.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
Pair 1	Posttest - Pretest	13.571	10.749	1.817	Lower	Upper			
					9.879	17.264	7.469	34	.000

Fig. 2

#### 4. Conclusions and recommendations

Researchers succeeded in developing media in accordance with the results of a questionnaire on student and teacher needs where flipbook-based learning media already contains pictures, learning videos, learning materials, quizzes and evaluation questions that are applied to science learning content on healthy environmental material. The product developed in this research is flipbook-based learning media with the application of the ADDIE research and development model.

If seen from the research results, the level of feasibility of flipbook-based learning media can be determined based on assessments from material experts and media experts. Aspects of material expert assessment include material aspects, completeness of learning tools, quality of student worksheets and evaluation questions, and grammar. The percentage of assessment from material experts is 80% with the criteria "fit for use". So flipbook-based learning media is worth trying out with slight improvements or suggestions from material experts. The assessment results from media experts on aspects of learning, navigation, interactivity, media, display, language and programs show a percentage of 80% with the criteria "feasible".

Which means that the learning media is worth testing according to recommendations or suggestions from media experts. So flipbook-based learning media is suitable for use in learning.

The use of flipbook-based e-learning learning media has been proven to improve the learning outcomes of fifth grade students at State Elementary Schools in Sarang District. This statement is proven by the N-gain calculation showing the medium criteria, namely 0.30. The results of the student response questionnaire concluded that the learning media developed according to the criteria was very feasible with a percentage of 97%. and the results of the teacher response questionnaire also show the criteria are very feasible with a percentage of 97%. The t-test results show that the Sig (2-tailed) value is  $0.000 < 0.05$ , so  $H_0$  is rejected and  $H_a$  is accepted, which means that the use of flipbook-based learning media is effective on the learning outcomes of fifth grade students at State Elementary Schools in Sarang District.

#### Acknowledgement

The author would like to thank the Almamater Universitas Muria Kudus. The author also would like to express her appreciation to the Master of Elementary Education Study Program, Faculty of Teacher Training and Education, Muria Kudus University.

#### Conflict of Interest

Authors declare there is no conflict of interest

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