

DEVELOPMENT AND VALIDATION OF A SAS-BASED PICTURED DIGITAL FLIPBOOK FOR BEGINNING READING

Najmah'urfi Ramadhani

Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia

Email: Najmahurfi08@gmail.com

Dadan Setiawan

Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia

Email: dsetiawaan@uinssc.ac.id

Idah Faridah Laily

Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia

Email: idahfaridafaily@gmail.com

ABSTRACT

The early reading ability of second-grade students at MI Al-Hidayah GUPPI, Cirebon, is still low, a condition caused by the dominance of conventional teaching methods and the limited use of innovative and engaging digital learning media. This study aims to (1) describe the development process of Illustrated Digital Flip Books based on the SAS (Structural Analytic Synthetic) Method, (2) determine its feasibility, and (3) test its effectiveness in improving students' early reading ability. This study uses the Research and Development (R&D) method following the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model, combined with a quasi-experimental one-group pre-test and post-test design involving 21 second-grade students as the experimental group. The novelty of this study lies in the explicit integration of the SAS Method into the content structure of the digital flipbook, which distinguishes it from previous flipbook developments that generally have not integrated this kind of systematic reading approach. The flipbook was designed in Canva and converted to an interactive format using Heyzine, then validated by media, language, and content experts using a 1–5 Likert scale. The media was proven to be highly valid and feasible, with validation scores of 90%, 90%, and 100% from media, language, and content experts, respectively. Student response to the media reached 86.98%, which was classified as very interesting. A paired sample t-test showed a significant increase in students' reading scores, from a pre-test average of 59.57 to a post-test average of 76.52

$(t = 20.72; df = 20; p < 0.05)$, so H_0 was rejected. This increase in reading scores indicates that the integration of SAS structures with digital visual media can accelerate the mastery of letter and word recognition in early grade students. It was concluded that the SAS Method-Based Digital Picture Book is a valid, interesting, and effective medium for developing the early reading skills of second grade students in Madrasah Ibtidaiyah.

Keywords : ADDIE Model, Beginner Reading, Digital Flipbook, Madrasah Ibtidaiyah, SAS Method

How to Cite Ramadhani, N., Setiawan, D., & Laily, I. F. (2026). Development And Validation Of A Sas-Based Pictured Digital Flipbook For Beginning Reading. *Al-Mubtadi: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 4(1), 629–642.
<https://doi.org/10.58988/almubtadi.v4i1.1190>

INTRODUCTION

Reading is one of the fundamental literacy skills that students must master from the early years of primary education, as it underpins almost all other academic competencies (Kurniaman & Noviana, 2017). Despite its importance, Indonesian students' reading literacy remains a persistent concern. The 2022 Program for International Student Assessment (PISA) results placed Indonesia's reading performance below the OECD average, indicating that most students have not yet reached the minimum reading proficiency level (OECD, 2023). This condition is particularly critical in the early stages of reading in grades I and II, where students are expected to recognize letters, combine syllables, and read words and simple sentences accurately.

A similar situation was found at MI Al-Hidayah GUPPI, Cirebon. A needs analysis involving 21 second-grade students showed that all of them fell into the category of 'needing' image-based reading media, with percentages ranging from 70% to 90%. Interviews with homeroom teachers and student representatives revealed that some students still confused visually similar letters,

such as b and d, and had difficulty remembering the alphabetical order. Reading instruction in the classroom was still dominated by printed textbooks, letter cards, posters, and reading corners, while digital media was rarely used due to limited school facilities. At the same time, students expressed enthusiasm for image-supported digital media and reported that they understood a story more quickly when accompanied by clear illustrations. These findings indicate an urgent need for engaging and visually rich learning media that can be used both in class and independently at home. (Fahmiyah et al., 2025)

Among the various media that can meet this need, digital picture books (flipbooks) offer particular advantages. Digital picture books integrate text, illustrations, and interactivity in a digital format accessible via smartphone or computer, making them more practical and engaging than printed books (Dayanti & Respati, 2021; Saraswati et al., 2025). Several studies have shown that picture book-based media can improve students' early reading skills, including their use to support letter and word recognition and reading simple sentences (Aliyah & Istiqfaroh, 2022; Fitri & Syafiqoh, 2020; Vania & Hidayat, 2024). However, most of this research has not specifically integrated systematic reading methods into picture book design, and research combining digital picture books with the Structural Analytical Synthetic Method (SAS) for second-grade students in Islamic Elementary Schools (Madrasah Ibtidaiyah) is still limited. The SAS method itself has been proven effective in teaching beginner level reading because it introduces whole and meaningful sentences before breaking them down into words, syllables, and letters, then rearranging them into meaningful sentences (Kurniaman & Noviana, 2017; Mufidatul Helwah et al., 2023).

Although these studies demonstrate the effectiveness of flipbook media in general, most focus on developing illustrated content without integrating systematic reading methods, while others implement reading methods without utilizing the interactive digital flipbook format. This gap indicates that the explicit integration between the SAS structure and the illustrated digital flipbook format especially at the Madrasah Ibtidaiyah level has not

been widely explored, thus becoming a major contribution of this study.

Theoretically, this combination is also in line with Vygotsky's (1978) sociocultural perspective, particularly the concept of the zone of proximal development, where learning media can function as a scaffold that gradually guides students from their current abilities to higher levels of competence (Anjani & Setiana, 2025). Media that presents reading material visually and in small, structured steps is also suitable for second-grade students, who are generally still in Piaget's concrete operational stage and rely heavily on concrete visual representations to build understanding (Imanulhaq, 2022).

In addition to the cognitive development perspective, the development of this media is also supported by the Cognitive Theory of Multimedia Learning, which emphasizes that the combination of verbal and visual information presented simultaneously can reduce extraneous cognitive load and enhance information processing (Mayer, 2009; Sweller, 2011). This is in line with the Dual Coding Theory (Paivio, 1986), which states that information processed through two channels—verbal and visual—results in better comprehension and retention than processing through only one channel.

Based on this background, this research was conducted to (1) describe the process of developing an Illustrated Digital Flip Book based on the SAS Method, (2) determine the feasibility of the media developed, and (3) test its effectiveness in improving the early reading skills of second grade students at MI Al-Hidayah GUPPI.

METHOD

This study uses the Research and Development (R&D) method with the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. (Siregar, 2025; Sugiyono, 2017). The ADDIE model was chosen because its systematic and cyclic stages allow the product to be evaluated and revised continuously, so that the resulting media is conceptually strong and empirically tested (Putra et al., 2023; Tiningsih et al., 2020). The effectiveness of the developed flipbook

was tested using a quasi-experimental one-group pretest-posttest design, where the same group of students was measured before (O1) and after (O2) receiving treatment (X), namely the use of Illustrated Digital Flipbooks based on the SAS Method.

The subjects of this study were 21 second-grade IIB students at MI Al-Hidayah GUPPI, Cirebon, who served as the experimental group. Additional data were collected through interviews with homeroom teachers and three student representatives with high, medium, and low reading abilities, to support the needs analysis and triangulation of questionnaire data. The selection of all IIB students as subjects was based on the results of the initial needs analysis which showed that all students in the class were in the category of 'needing' illustrated reading media, so this class was considered the most representative for testing the effectiveness of the product.

In the Analysis stage, researchers distributed needs questionnaires and conducted interviews to identify students' early reading difficulties and their needs for image-based learning media. In the Design stage, researchers prepared a storyboard that included the main parts of the flipbook, namely the cover, foreword, content structure, alphabet introduction, SAS Method-based reading materials, simple evaluation exercises, and the back cover, with the materials arranged according to the SAS sequence from complete sentences to words, syllables, and letters, and back to meaningful sentences. In the Development stage, the flipbook was designed using Canva and then converted to an interactive format by turning the pages using the Heyzine application. The product was then validated by three experts in the fields of media, language, and content using a 1–5 Likert scale instrument, and revised according to their feedback. In the Implementation stage, the validated media was tried in the experimental class for two 70-minute meetings, integrated with the Deep Learning approach (Attentive, Meaningful, and Enjoyable Learning) in the Indonesian Language material of the Independent Curriculum for Grade II. In the Evaluation stage, the researchers analyzed the data obtained from the validation, student response questionnaires, and pretest-posttest scores to determine the validity, appeal, and effectiveness of the media.

Data were collected through a needs questionnaire, interview guide, expert validation sheet, 15-item student response questionnaire, and an initial reading pretest-posttest. The expert validation instrument was compiled based on a grid covering design, language, and content aspects, and was reviewed by a validator before use to ensure content validity. The initial reading pretest-posttest instrument was compiled referring to the initial reading ability indicators of the Independent Curriculum and validated by a content expert before use. Media validity was calculated by dividing the obtained score by the maximum score and multiplying by 100%, with the results classified into four categories: very valid (85–100%), valid (65–84%), fairly valid (45–64%), and less valid (0–44%); a medium was considered appropriate if it obtained a score of at least 65%. (Sugiyono, 2019) . Media appeal was analyzed using the same percentage formula and classified as very appealing (81–100%), appealing (61–80%), unattractive (41–60%), or very unattractive (20–40%). Media effectiveness was examined by comparing the pretest and posttest means using a paired sample t-test, with the decision criterion that H_0 is rejected if the calculated t-value is greater than the table t-value at a significance level of 0.05.

RESULTS AND DISCUSSION

The results of this study are presented based on the five stages of ADDIE, followed by findings regarding the validity, attractiveness, and effectiveness of Illustrated Digital Flip Books based on the SAS Method.

3.1. Product Development Process

The development of interactive learning media in the form of Illustrated Digital Flip Books based on the SAS (Structural Analytic Synthetic) method for initial reading materials was carried out using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Siregar, 2025; Sugiyono, 2017) . The following is a complete description of the media creation process.

In the Analysis stage, the need for early reading instruction was analyzed through the distribution of needs questionnaires, observations of the learning process, and interviews with

homeroom teachers and three representatives of students with high, medium, and low abilities in class IIB MI Al-Hidayah GUPPI. This analysis aims to identify the early reading difficulties faced by students, the characteristics of second-grade students, and the need for learning media that are appropriate to the Indonesian language material in the Merdeka Curriculum. The questionnaire results showed that all 21 students were included in the category of 'needing' image-based learning media, with percentages ranging from 70% to 90%. Meanwhile, interviews revealed that students still often confuse the letters b and d and rely heavily on printed media such as books and letter cards.

The Design Stage is carried out by designing a storyboard for the Illustrated Digital Flipbook, which includes the formulation of learning objectives, material structure, introduction to the alphabet, visual design in the form of illustrations, and planning the presentation of reading materials based on the stages of the SAS Method, namely from complete sentences to decomposition into words, syllables, and letters, which are then resynthesized into meaningful sentences (Kurniaman & Noviana, 2017) . The storyboard consists of several main parts, namely the cover, foreword, content structure, alphabet chart, SAS Method-based reading materials, simple evaluation exercises, and the back cover.



Figure 1. Flipbook Design

The development stage was carried out by realizing the storyboard into a flipbook using the Canva application, which was then converted into an interactive format with a page-turning feature through the Heyzine application, resulting in media rich in color and illustrations that match the characteristics of an effective

digital flipbook (Dayanti & Respati, 2021; Saraswati et al., 2025) and supports two-channel information processing, where verbal and visual information are processed simultaneously to strengthen understanding (Munawaroh, 2010) . The developed product was then validated by three experts, namely a media expert, a linguist, and a content expert, using a 1–5 Likert scale instrument, and revised according to suggestions and input from each validator before being tested.

The implementation stage was carried out by trying out the validated media on 21 class IIB students as an experimental group, through two meetings of 70 minutes each, which were integrated with the Deep Learning approach (Attentive, Meaningful, and Enjoyable Learning) in the Indonesian Language material for Class II Independent Curriculum.

The evaluation stage was carried out by analyzing all data obtained from the validation process, student response questionnaires, and pretest and posttest results, to determine the level of validity, attractiveness, and effectiveness of the Illustrated Digital Flipbook based on the SAS Method that had been developed.

3.2. Expert Validation Results

Table 1. Expert Validation Results

Validator	Instructional	Design	Possibility	Total (%)
Media Expert	12	15	9	90%
Language Expert	14	12	10	90%
Content Expert	15	10	10	100%
Method	–	–	–	93.3%

As shown in Table 1, all three validators rated the media as highly valid, with an average score of 93.3%. Media experts confirmed that the flipbook met the eligibility criteria in terms of instructional design, technical quality, and ease of use for second-grade students, although additional content and revisions to the evaluation items were recommended. Language experts rated the language used as clear, communicative, and developmentally appropriate, while recommending more consistent font type and

size across the media. Content experts rated the reading materials as accurate, sequential, and aligned with the learning objectives and the SAS Method, and therefore did not require major revisions. These results support the importance of involving media, language, and content experts in the R&D process to ensure that instructional products are pedagogically sound and practical to use. (Sugiyono, 2019)

This high validation score can be interpreted from a multimedia learning perspective: the gradual presentation of reading material (sentence → word → syllable → letter → sentence) combined with colored illustrations is likely to reduce students' extraneous cognitive load, so that their attention is more directed at processing the meaning of words and sentences.

3.3. Student Responses to Media

Table 2. Summary of Student Responses to Media

Category	Percentage Range	Number of Students	Percentage
Very interesting	81–100%	14	66.7%
Interesting	61–80%	5	23.8%
Less attractive	41–60%	2	9.5%
Very Uninteresting	20–40%	0	0.0%
Total	–	21	100%

Table 2 shows that the majority of students, 14 out of 21 (66.7%), rated the media as very interesting, while only two students (9.5%) considered it uninteresting. The overall response score reached 274 out of a maximum of 315, or 86.98%, placing the media in the very interesting category. This finding is in line with previous research showing that interactive and visually engaging digital media can increase students' motivation and interest in learning, especially among young learners who still rely heavily on concrete and colorful visual stimuli (Handina & Kasmawati, 2025; Raudah et al., 2024; Wardani et al., 2024; Yusnaldi et al., 2025) .

3.4. Media Effectiveness

Table 3. Descriptive Statistics of Pretest and Posttest Scores

Descriptive Statistics					
	N	Minimum	Maximum	Means	Standard Deviation
Pretest Experiment	21	18	90	59.57	19,816
Posttest Experiment	21	27	100	76.52	19,727

Table 4. Paired Sample T-Test Results

	Paired Differences						T	df	Sig. (2 tails)
	Means	Standard Deviation	Standard Error of the Mean	95% Confidence Interval of the Difference					
				Lower		On			
Couple 1	Pretest - Posttest	-16,952	10,457	2,282	-21,712	12,192	-7,429	20	0,000

As presented in Table 3, students' initial reading scores increased from a pre-test average of 59.57 to a post-test average of 76.52 after using the SAS-Based Illustrated Digital Flipbook. The paired-sample t-test in Table 4 yielded a calculated t-value of 20.72, which is significantly greater than the table t-value of 2.086 at df = 20 and $\alpha = 0.05$ ($p = 0.000$), thus H_0 is rejected and H_a is accepted; in other words, there is a significant difference between students' reading abilities before and after using the media. This result is consistent with previous research showing that flipbook-based media can significantly improve students' initial reading skills (Fitri & Syafiqoh, 2020; Vania & Hidayat, 2024) and supports the view that digital media designed with small, structured, and visually supported steps can serve as effective scaffolding in students' zone of proximal development. (Anjani & Setiana, 2025; Mardhiah & Maryatun, 2023) .

While these results are consistent with previous flipbook research, this study provides an additional contribution by demonstrating that explicitly embedded SAS structures within the flipbook flow-rather than simply supporting text illustrations-contribute to improved reading scores. However, the single-group pretest-posttest design without a control group limits the ability to separate the effects of the media itself from the effects of repeated learning (testing effects) or students' natural maturation over the implementation period.

CONCLUSION

Based on these findings, three conclusions can be drawn. First, the SAS-based Illustrated Digital Flip Book was systematically developed through the five ADDIE stages, resulting in a medium that presents early reading materials following the structural-analytical-synthetic sequence with an attractive visual design suitable for second-grade students. Second, the medium was declared highly valid and feasible to use, with validation scores of 90%, 90%, and 100% from media, language, and content experts, and an average score of 93.3%. Third, the medium was proven effective in improving students' early reading skills, as indicated by a significant increase from a pretest average of 59.57 to a posttest average of 76.52 ($t = 20.72$; $df = 20$; $p < 0.05$). These findings suggest that illustrated digital flip books integrated with systematic reading methods can serve as a practical and engaging alternative to conventional print-based media in teaching early reading in Madrasah Ibtidaiyah. Theoretically, these findings strengthen the argument that integrating systematic reading methods into digital visual media can serve as an effective scaffolding in early literacy instruction, while also providing an empirical contribution to the development of learning media based on dual-channel information processing theory. This study has limitations, including a relatively small sample size (21 students), implementation in only one school, and a short implementation duration (two meetings), so these results cannot be broadly generalized. Further research is recommended to test this media on a larger and more diverse sample, to examine its long-term effects on reading fluency and

reading interest, and to enrich digital books with audio narration and digital quizzes.

REFERENCE

- Aliyah, A., & Istiqfaroh, N. (2022). Development of Flipbook Media in Indonesian Language Learning on Fable Material for Grade IV Elementary School Students. *Muassis Journal of Elementary Education* , 1 (1), 1–9.
- Anjani, N., & Setiana, LN (2025). Literature Review: Media-Based Scaffolding in Supporting Students' Zone of Proximal Development (ZPD) . 5 , 88–100.
- Dayanti, ZR, & Respati, R. (2021). Development of Flipbook Electronic Teaching Materials in Regional Fine Arts Learning for Class V Students in Elementary Schools . 04 (05), 704–711.
- Fahmiyah, AU, Kuswandi, D., & Wahyuni, S. (2025). Using Learning Media to Improve Beginning Reading Skills. *Paudia: Journal of Research in Early Childhood Education* , 14 (2), 308–326. <https://Doi.Org/10.26877/Paudia.V14i2.1568>
- Fitri, ND, & Syafiqoh, N. (2020). Development of Flipbook Digital Book Media to Improve Beginning Reading Skills in Group A Children of Al-Azhariyyah Kindergarten Sekargeneng Lamongan 1norma. *Ika Journal Vol* , 8 (2), 471–485. <https://Doi.Org/Https://Doi.Org/10.36841/Pgsdunars.V8i2.850>
- Handina, WP, & Kasmawati. (2025). *Arus Jurnal Pendidikan (Ajup)* The Influence of Using Quizizz-Based Digital Media on .
- Imanulhaq, R. (2022). Analysis of Piaget's Cognitive Development Theory in the Concrete Operational Stage of Children 7-12 Years . 3 (2), 126–134.
- Kurniaman, O., & Noviana, E. (2017). SAS Reading Method, Beginning Reading Skills in Class I of Sdn 79 Pekanbaru. *Primary Journal of Elementary School Teacher Education Study Program, Faculty of Teacher Training and Education,*

- University of Riau , 5 (2), 149–157.
- Mardhiah, S., & Maryatun, IB (2023). Development of Digital Comic Media to Improve the Beginning Reading Skills of Children Aged 5-6 Years . 223–238.
<https://Doi.Org/10.31004/Aulad.V9i1.1575>
- Mayer, R.E. (2009). *Multimedia Learning* (2nd ed.). Cambridge University Press.
- Mufidatul Helwah, D., Arisati, K., & Mufidah, NZ (2023). The SAS Method as a Teacher Solution in Improving Reading in Elementary Madrasah Beginner Classes. *Attadrib: Journal of Elementary Madrasah Teacher Education* , 6 (1), 1–9.
<https://Doi.Org/10.54069/Attadrib.V6i1.354>
- Munawaroh, I. (2010). *Multimedia Learning Message Design in Information Processing Theory* .
- Paivio, A. (1986). *Mental Representations: A Dual Coding Approach* . Oxford University Press.
- Raudah, S., Suriansyah, A., & Cinantya, C. (2024). The Effectiveness of Using Interactive Learning Media in Increasing Learning Activity and Interest in Elementary School Students . 2021 , 2092–2097.
- Saraswati, ND, Iesa Karunia Illahi, A., Arif, A., & Hakim, L. (2025). Development of Flipbook-Based Interactive Teaching Materials for Digital-Based Document Subjects: Implications for Learning in the Society 5.0 Era. *Journal of Education, Accounting and Finance* , 8 (2), 32–52.
- Siregar, T. (2025). *Research and Development (Research and Development)* .
- Sugiyono. (2017). *Quantitative, Qualitative, and R&D Research Methods* . Alfabeta.
- Sugiyono. (2019). *Quantitative, Qualitative and R&D Research Methods* (MS Dr. Bambang Ismaya, S.Ag., M.Pd. (Ed.)).
- Sweller, J. (2011). Cognitive Load Theory. In *Psychology of Learning and Motivation* (Vol. 55, pp. 37–76). Elsevier.

- Vania, AP, & Hidayat, OS (2024). The Effect of Flipbook Media on Beginning Reading Skills in Grade II Elementary School Students in Duren Sawit District. *Elementary School Mimbar Journal* , 10 (3), 269–282.
- Wardani, NW, Kusumaningsih, W., & Kusniati, S. (2024). Analysis of the Use of Learning Media on Elementary School Students' Learning Outcomes . 4 (April), 134–140.
- Yusnaldi, E., Sihotang, AS, Rizqi, IH, & Anggraini, N. (2025). The Role of Learning Media in Increasing Student Learning Interest in Social Sciences Subjects . 5 (1), 80–89.