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The Implementation of Teaching Materials with a Synthetic Analytical Structure Model Using Canva to Improve Early Reading and Writing Skills in Grade 1 Elementary School Students

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Abstract
This study aims to analyze the development process, feasibility, and effectiveness of teaching materials based on the Synthetic Analytical Structure model, assisted by the Canva application, in improving the early reading and writing skills of first-grade students, involving 10 students in the limited trial and 44 students in the extensive trial, as well as identifying obstacles faced by teachers and students. The research method uses a simplified Borg and Gall Research and Development model approach through the stages of needs analysis, product design, expert validation, revision, limited trials, extensive trials, and final product preparation. The results show that the teaching materials, Student Worksheets (LKPD), learning media, and Lesson Plans (RPP) are in the very feasible category. Students' reading ability has improved, indicated by the average score of the limited test from 7.6 to 13.5 and the extensive test from 7.43 to 12.09. Writing ability also increased significantly, from an average of 76.1 to 88.1 in the limited test and from 72.4 to 86.9 in the extensive test, with moderate N-gain scores of 0.41 in the limited trial and 0.51 in the extensive trial.. Interviews revealed student challenges with letter and word writing, and writing speed, as well as teacher challenges with limited learning time. Therefore, SAS-based teaching materials with Canva proved effective as an interactive, systematic, and enjoyable alternative for early literacy learning.

Keywords: Canva; Read; Synthetic Analytical Structure (SAS); Teaching Materials; Writing Beginnings

INTRODUCTION

Early reading and writing skills are the main foundation of literacy in elementary school, especially in the early grades. In this phase, students not only learn to recognize letters and sounds but also begin to build connections between symbols, meanings, and motor skills in writing. Ideally, early grade students are

expected to be able to recognize and differentiate letters, connect sounds with letter symbols, read simple words and sentences fluently, and write letters and words coherently, clearly, and meaningfully. Furthermore, early reading and writing skills also include a simple understanding of reading content and the ability to express basic ideas through writing in accordance with the students' cognitive and language developmental stages. Delays in mastering reading and writing in the early grades have long-term impacts on students' academic achievement at subsequent levels, including difficulties in understanding texts and expressing ideas in writing (Sari et al., 2020; Snow & Matthews, 2016).

However, the practice of teaching early reading and writing in elementary schools still faces various challenges. Early reading and writing instruction is often mechanistic, emphasizing memorization of letters and syllables without adequate understanding of language structure, resulting in students being less able to integrate reading and writing skills meaningfully (Abidin et al., 2021). This is in line with the results of initial observations conducted at an elementary school in Karawang Regency, which showed that 40% of first-grade students still experienced difficulty reading simple words and writing letters coherently. Although the number of students experiencing these difficulties is not dominant, efforts are still needed to create effective and meaningful learning. Furthermore, teachers reported that learning is still dominated by lecture methods such as spelling, shared reading, and the use of textbooks, while the use of digital learning media is not optimal. Students also appear to quickly become bored and less active, quickly becoming tired of participating in reading and writing activities, especially when lessons last for relatively long periods. This condition demands teaching materials and learning approaches that are not only systematic but also contextual and easy for lower-grade students to understand.

Based on these problems, the development of teaching materials is a very important aspect in learning to read and write early, because teaching materials function as the main means that connect learning objectives, materials, and learning experiences of early grade students. Systematically designed teaching materials help students understand the relationship between language elements gradually, while a contextual approach allows learning materials to be closer to students' daily experiences so that they are easier to understand. In addition, the visual presentation of teaching materials has been proven to increase students' attention, motivation, and involvement in the early literacy process, especially for lower grade students who are still at the concrete thinking stage. Therefore, the development of teaching materials that pay attention to systematic aspects, context, and visualization is an important foundation in supporting the success of learning to read and write early in elementary school.

One relevant approach in early literacy learning is the Synthetic Analytical Structure (SAS) method. The Synthetic Analytical Structure (SAS) method is an early reading learning approach that emphasizes a gradual process of language introduction, starting from the complete language structure to small parts, then synthesizing them again into a meaningful whole. Dewi (2019) equates that the SAS method helps students understand the relationship between sentences, words, syllables, and letters through a systematic analysis and synthesis process that is in accordance with the cognitive development of early elementary school students. Therefore, the SAS model can be integrated with teaching materials developed to improve the early reading and writing skills of first grade elementary school students.

The steps of the SAS method include the introduction of meaningful sentences or discourse, analysis of sentences into words, words into syllables and letters, as well as a re-synthesis process to strengthen reading and writing comprehension (Muhyidin et al., 2018). The advantage of the SAS method lies in its ability to foster reading comprehension in a meaningful way, develop language skills in an integrated manner, and reduce mechanistic learning that only focuses on memorizing letters. However, the SAS method also has limitations, including requiring the teacher's ability to design material systematically, requiring relatively longer learning time, and potentially causing boredom in students if it is not supported by interesting and varied learning media.

On the other hand, developments in educational technology open up opportunities to integrate digital media into literacy learning. The use of interactive visual media has been shown to increase early grade students' attention, motivation, and understanding of reading and writing materials. Simple, visual-based digital media is particularly suitable for use in first grade elementary school because it helps students

recognize letter and word shapes in a more engaging way (Faridah & Rozi, 2025). Therefore, integrating digital media into learning is crucial for creating active and creative learning.

One application with the potential to support literacy learning is Canva. Canva offers easy-to-use visual design features, enabling teachers to present reading and writing materials in the form of word cards, syllables, illustrations, and interactive activities. Several studies have shown that using Canva in elementary schools can increase student engagement, clarify abstract material, and support visual-based learning that is appropriate for the characteristics of early grade students (Khasanah, 2024) .

Based on field conditions and the description above, there is a gap between the needs of early literacy learning and the teaching materials and learning models applied in the classroom. Although the Synthetic Analytical Structure approach has been recognized as effective and digital media such as Canva are available, the integration of the two in the form of teaching materials based on systematic and practical learning models is still rarely developed, especially to improve the early reading and writing skills of first-grade elementary school students. To the best of current knowledge, there is limited empirical research that systematically integrates the Structural Analytical Synthetic (SAS) model with digital visual design media such as Canva into structured teaching materials. Most previous studies have tended to examine the SAS model or the use of Canva separately, rather than combining both approaches within a coherent instructional framework that is empirically tested for early literacy outcomes. Therefore, further research is needed to develop and validate integrated SAS-based digital teaching materials that are pedagogically grounded and practically applicable in early-grade classrooms.

This study aims to determine and analyze the development process, feasibility, and effectiveness of teaching materials with the Synthetic Analytical Structure model assisted by the Canva application in improving the early reading and writing skills of first grade elementary school students, as well as identifying obstacles faced by teachers and students in implementing learning using these teaching materials. In line with these objectives, this study is generally directed at developing teaching materials based on the Synthetic Analytical Structure model assisted by the Canva application that are valid, practical, and effective, so that they are expected to be able to answer the needs of early literacy learning that is more interesting, systematic, and contextual, and in accordance with the characteristics of early grade students and learning conditions in elementary schools.

RESEARCH METHODS

Research Design

This research uses a Research and Development (R&D) approach with reference to the Borg and Gall development model. Borg and Gall explain that research and development is a systematic process used to develop and validate educational products so that they can be used effectively in learning activities (Maydiantoro, 2021). This development research aims to produce a product in the form of teaching materials with a Synthetic Analytical Structure learning model assisted by the Canva application that is suitable for use in improving the reading and writing skills of first grade elementary school students. The Borg and Gall model was chosen because it provides systematic stages, starting from needs analysis, product development, to testing the product's effectiveness in the field, thus aligning with the objectives of development research in the field of elementary education.

Research Target/Subject

This research was conducted in the odd semester of the 2025/2026 academic year at a public elementary school in Karawang Regency, West Java. The research location was selected based on initial observations, which indicated that first-grade students still had difficulties with their initial reading and writing skills, and the limited use of digital learning media in early literacy learning. The target of this research is teaching materials based on the Synthetic Analytical Structure learning model assisted by the Canva application for first-grade elementary school students. The research subjects included first-grade students as the main users of the learning model, first-grade teachers as users and providers of feedback on the developed product, as well as experts in teaching materials, learning media, Lesson Plans, and Student Worksheets who played a role in the product validation process.

Research Procedure

This research and development procedure adapts the steps of Borg and Gall which have been simplified into several stages. The first stage is a needs analysis through observation, interviews, and documentation studies to identify problems in learning to read and write beginning. The second stage is product planning and design which includes the preparation of the syntax of the learning model, material selection, and the design of learning media using the Canva application. The third stage is the development of the initial product in the form of teaching materials based on Synthetic Analytical Structural using the Canva application. The fourth stage is product validation by experts in teaching materials, LKPD, RPP and learning media to determine the product's feasibility. The fifth stage is product revision based on input from experts. The sixth stage is a limited trial involving first-grade students and teachers to obtain practicality data and user responses. The seventh stage is a broad trial stage involving first-grade students and teachers to obtain practicality data and user responses on a wider scale. The final stage is product refinement based on the trial results to produce a final product that is ready for use. These stages are visualized in the following figure.

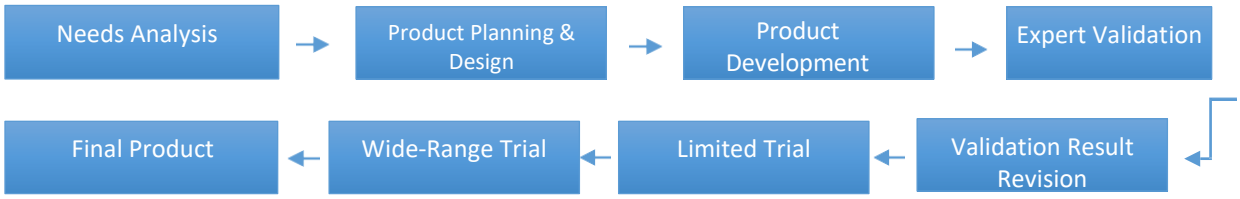

Figure 1. Adapted Floating Model Design from Borg & Gall

Instruments, and Data Collection Techniques

The research instruments used in this study consisted of observation sheets, interview guides, questionnaires, and initial reading and writing ability tests. Observation sheets were used to observe the learning process and student engagement. Interview guides were used to obtain information about learning needs from teachers. Questionnaires were used to determine the level of validity and practicality of the product based on expert assessments and user responses. Initial reading and writing ability tests were used to measure student improvement after using the developed learning model.

The data in this study were collected through writing ability tests, initial reading observations, interviews, and validation sheets. The writing ability test was used to measure students' initial writing abilities before and after the implementation of the learning. The initial writing indicators used were: a) appropriateness of content to the object, b) use of capital letters, c) completeness of letters, d) use of punctuation, e) clarity of writing (Ministry of National Education, 2009). Initial reading observations were used to assess students' development related to initial reading that had been adjusted to Munisah's (2019) initial reading indicators , namely fluency, clarity of voice, intonation, and courage. Interviews were used to obtain information directly from teachers and students regarding obstacles during the implementation of teaching materials with the SAS model assisted by the Canva application. Validation sheets were used to obtain data on the feasibility of teaching materials with the SAS model assisted by the Canva application.

Data analysis technique

The data analysis techniques used in this study include qualitative and quantitative data analysis. Qualitative data were analyzed through the stages of data reduction, data presentation, and drawing conclusions (Miles, Huberman, & Saldaña, 2014) . Quantitative data obtained from the test instrument were analyzed using inferential statistics with the SPSS 26 application to determine effectiveness. The statistical tests used were the normality test, the paired sample t-test/Wilcoxon test, and calculating N-gain to determine the improvement in students' writing skills, as these tests are appropriate for analyzing pretest–posttest data, determining statistical significance, and measuring the magnitude of learning improvement accurately and comprehensively.

A developed product is declared successful if it meets the criteria of validity, practicality, and effectiveness. Validity criteria are determined based on expert assessments of teaching materials, student worksheets (LKPD), media, and lesson plans (RPP). Practicality criteria are assessed based on teacher and student responses to the use of the learning model. Effectiveness criteria are determined based on improvements in students' initial reading and writing skills after using teaching materials based on the Synthetic Analytical Structure learning model assisted by the Canva application.

RESULTS AND DISCUSSION

Result

The Process of Developing Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

This research resulted in a product in the form of teaching materials based on the Synthetic Analytical Structure (SAS) learning model assisted by the Canva application to improve the initial reading and writing skills of first-grade elementary school students. The teaching material development process was carried out through a simplified Borg and Gall Research and Development (R&D) stage, including needs analysis, initial product design, expert validation, product revision, limited trials, extensive trials, and the final product.

During the needs analysis phase, initial observations at an elementary school in Karawang Regency revealed that reading and writing instruction remained conventional, did not utilize digital visual media optimally, and did not fully accommodate the learning characteristics of early grade students. These findings formed the basis for developing SAS-based teaching materials that maintain the model's core syntax but expand the learning steps by integrating the Canva application as an interactive visual medium.

The initial product design phase then resulted in a teaching material design based on the SAS learning model with the development of integrated learning steps using Canva. The main SAS syntax was retained, but each stage was enhanced with digital visuals. Complete sentences were presented in a Canva design that combined text, images, and attractive colors. The word and letter analysis process was carried out through simple slide animations, while the synthesis phase was complemented by writing and word arrangement exercises in visual-based Student Worksheets (LKPD). The initial product was also equipped with learning tools in the form of teacher modules, student teaching materials, LKPD, and evaluation instruments tailored to the characteristics of early grade students.

The product design was then validated by experts in teaching materials, student worksheets (LKPD), learning media, and lesson plans (RPP). Validation results showed that all product components met the eligibility criteria. The validators assessed that the development of Canva-assisted SAS steps did not change the model's essence but instead strengthened the understanding of early literacy concepts. The product was then revised based on the validators' suggestions by clarifying Canva's instructions for use, simplifying the instructional text in the teaching materials, and adjusting the difficulty level of the writing exercises. These revisions resulted in a product that was more operational and easier to implement in the classroom without increasing teachers' workload.

The next stage was a limited trial involving 10 first-grade students. At this stage, initial reading skills were measured using an observation sheet, while writing skills were measured through a pretest and posttest. The results of the limited trial showed that in the initial stage, students were not yet able to read and write well according to the predetermined indicators. However, after the implementation of the learning, students showed positive progress related to their initial reading and writing skills. The complete results of the limited trial will be described in the section on the effectiveness of teaching materials using the SAS model assisted by the Canva application.

Following the limited trial, a field trial was conducted to determine the effectiveness of the SAS model in improving students' early reading and writing skills on a broader scale. The large-scale trial revealed striking differences compared to the limited trial. These differences were evident in the characteristics of each student in receiving learning. This was possible due to differences in schools and the teachers' teaching

methods. This created diversity, making the classroom more lively and harmonious. Furthermore, students demonstrated active involvement and positive enthusiasm in participating in the learning process, making learning more lively and meaningful. The model development process and key findings are presented in Table 1 below.

Based on the development stages implemented, from needs analysis, design, development, and validation by experts, the final product is a Synthetic Analytical Structure (SAS) model-based teaching material, supported by the Canva application. This teaching material was systematically designed, taking into account the characteristics of first-grade elementary school students and the needs of early reading and writing learning. The presentation of the teaching material that has been developed and used in the learning process is presented in the following description.

Figure 1. Section of the Developed Teaching Materials

The results of the research on the process of developing teaching materials based on the Synthetic Analytical Structure (SAS) model were deepened through data obtained in the field, which were related to the results of the feasibility test, the effectiveness of SAS-based teaching materials in improving the reading and writing skills of first grade elementary school students, as well as the obstacles faced by students and teachers in implementing learning using the Synthetic Analytical Structure (SAS) model to improve students' reading and writing skills.

The Feasibility of Teaching Materials with Synthetic Analytical Structure (SAS) Model Assisted by Canva Application to Improve Elementary School Students' Early reading and Writing Skills

The feasibility test results were obtained through a validation questionnaire administered to experts in teaching materials, student worksheets (LKPD), learning media, and lesson plans (RPP). The questionnaire was structured according to indicators related to the learning model being developed. The validation results are presented in the following table.

Table 1. Feasibility Test Results

Component	Validator 1			Validator 2			Validator 3		
	Score	%	Note:	Score	%	Note:	Score	%	Note:

Teaching materials	106	84.80%	Very Feasible	108	86.40%	Very Worthy	123	98.40%	Very Feasible
LKPD	91	86.87%	Very Feasible	90	85.71%	Very Worthy	105	100.00%	Very Feasible
Instructional Media	86	86.00%	Very Feasible	83	83.00%	Very Worthy	100	100.00%	Very Feasible
Lesson Plan	91	86.67%	Very Feasible	89	84.76%	Very Worthy	105	100.00%	Very Feasible

Based on the feasibility test results presented in Table 2, it can be seen that all components developed, including teaching materials, LKPD, learning media, and RPP, received an assessment in the *"Very Feasible" category* from the three validators. In the teaching materials component, Validator 1 gave a score of 106 with a percentage of 84.80%, Validator 2 gave a score of 108 with a percentage of 86.40%, and Validator 3 gave a score of 123 with a percentage of 98.40%. These results indicate that the developed teaching materials are in accordance with the characteristics of grade I students and support early reading and writing learning using the Synthetic Analytical Structure (SAS) model.

The LKPD components also demonstrated a very high level of feasibility. Validator 1 gave a score of 86.87%, Validator 2 85.71%, and Validator 3 a maximum score of 100%. This indicates that the LKPD developed includes clear, systematic activities and facilitates active student engagement in the early reading and writing learning process.

For the learning media component, all validators gave a rating of *"Very Appropriate* ," with percentages of 86.00%, 83.00%, and 100%, respectively. These results indicate that the Canva-assisted learning media is visually appealing, easy to use, and appropriate for the learning needs and characteristics of first-grade elementary school students.

Meanwhile, the Learning Implementation Plan (RPP) component obtained a feasibility percentage of 86.67% from Validator 1, 84.76% from Validator 2, and 100% from Validator 3. This assessment indicates that the RPP has been prepared systematically, in line with the syntax of the SAS model, and is able to support the achievement of the learning objectives of early reading and writing.

Although all components were deemed highly suitable, the validators still provided some input for product improvement. Validator 1, as a content expert, suggested that the teaching materials and student worksheets (LKPD) emphasize the relationship between images and text to strengthen students' understanding of early reading and writing concepts. Furthermore, the example words and sentences were suggested to use vocabulary more relevant to students' everyday lives for easier comprehension.

Validator 2 as an expert in media and learning models provided input regarding the improvement of the visual appearance of learning media, especially on the consistency of color use, font size, and layout to make it more friendly for first grade students. The validator also suggested that the learning steps in the lesson plan be made more detailed and systematic to make it easier for teachers to implement the SAS model assisted by the Canva application in the classroom.

Meanwhile, Validator 3, a practitioner and first-grade teacher, suggested that the LKPD be supplemented with additional practice variations to accommodate differences in student abilities. Furthermore, it was suggested that the teaching materials be supplemented with simpler and clearer instructions for use to make them easier for both teachers and students to understand.

Overall, the results of the feasibility test indicate that the teaching material product based on the Synthetic Analytical Structural (SAS) model assisted by the Canva application has met the feasibility criteria and is ready to be used in the initial reading and writing learning process, with minor improvements according to input from the validators to produce a more optimal product.

The Effectiveness of Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

Furthermore, improvements in early reading skills were measured using an observation sheet that included indicators of fluency, clarity, intonation, and boldness. Observations were conducted at each meeting from meeting 1 to meeting 6. The results of the early reading observations are presented in the following table.

Table 2. Results of Observations on Initial Reading During Limited Trials and Extensive Trials

Limited Test	Meeting					
	1	2	3	4	5	6
Average Score	7.6	8.9	9.8	10.7	12.5	13.5
Percentage	47.50	55.63	61.25	66.88%	78.13%	84.38
information	Enough	Enough	Good	Good	Good	Very good
Extensive Trial	**Meeting**					
\	1	2	3	4	5	6
Average Score	7.43	8.30	9.02	9.80	11.23	12.09
Percentage	46.45%	51.85%	56.39%	61.22%	70.17%	75.57%
Information	Enough	Enough	Enough	Good	Good	Good

Based on the results of observations of initial reading skills presented in Table 3, there is an increase in students' reading skills both in limited trials and extensive trials at each meeting. In limited trials, the average initial reading score of students at the first meeting was 7.6 with a percentage of 47.50% and was in the *sufficient category* . At the second meeting, the average score increased to 8.9 with a percentage of 55.63% and was still in the *sufficient category* . An increase was seen again at the third meeting with an average score of 9.8 and a percentage of 61.25% which was already in the *good category* .

The improvement in students' initial reading skills in the limited trial continued from the fourth to sixth meetings. At the fourth meeting, the average score reached 10.7 with a percentage of 66.88% and was categorized as good. Furthermore, at the fifth meeting, the average score increased significantly to 12.5 with a percentage of 78.13% and remained in the good category. At the sixth meeting, the average score reached 13.5 with a percentage of 84.38% and was already in the very good category. These results indicate that the application of teaching materials based on the Synthetic Analytical Structure (SAS) model assisted by the Canva application was able to gradually improve students' initial reading skills in the limited trial.

Meanwhile, in the extensive trial, improvements in early reading skills were also seen at each meeting, although at a relatively more gradual rate compared to the limited trial. In the first meeting, the average score was 7.43, representing 46.45% of the students' achievement, and categorized as sufficient. In the second meeting, the average score increased to 8.30, representing 51.85% of the students' achievement, remaining in the sufficient category. In the third meeting, the average score reached 9.02, representing 56.39% of the students' achievement, remaining in the sufficient category.

In the fourth meeting of the extensive trial, the average score increased to 9.80 with a percentage of 61.22% and fell into the good category. Improvement was seen again in the fifth meeting with an average score of 11.23 and a percentage of 70.17%, which fell into the good category. In the sixth meeting, the average score reached 12.09 with a percentage of 75.57% and remained in the good category. Although the final results of the extensive trial did not reach the very good category, the data showed a consistent increase in students' early reading skills at each meeting.

Overall, the observation results indicate that the implementation of teaching materials based on the Synthetic Analytical Structure (SAS) model, supported by the Canva application, had a positive impact on improving the early reading skills of first-grade elementary school students. The difference in achievement between the limited and extensive trials was influenced by student characteristics, school conditions, and variations in the learning process, but both showed a positive and sustainable upward trend.

Students' writing abilities were analyzed through pretests and posttests administered to 10 first-grade elementary school students during a limited trial and 44 first-grade students during a broader trial. Pretest and posttest scores were then analyzed descriptively to obtain a clear picture of students' writing abilities. The results of this descriptive analysis are presented in the following table.

Table 3. Descriptive Statistics of Pretest and Posttest Results of Students' Writing Ability

Statistics	Limited Trial			Wide-Range Trial		
	Pretest	Posttest	Note:	Pretest	Posttest	Note:
Number of Students	10	10	Pre = Post	44	44	Pre = Post
Minimum Score	68	80	Pre < Pos	45	75	Pre < Pos
Maximum Score	87	97	Pre < Pos	90	98	Pre < Pos
Average	76.1	88.1	Pre < Pos	72.4	86.9	Pre < Pos
Standard Deviation	5.6	4.7	Pre > Pos	9.8	4.7	Pre > Pos

Based on the results of descriptive analysis on a limited trial involving 10 students, it was found that the average pretest score of 76.1 increased to 88.1 in the posttest. The minimum score increased from 68 to 80, while the maximum score increased from 87 to 97. This indicates that student learning outcomes after the treatment were better than before the treatment (pretest < posttest). In addition, the standard deviation decreased from 5.6 in the pretest to 4.7 in the posttest, which indicates that student learning outcomes after the treatment became more homogeneous.

In a large-scale pilot study involving 44 students, a similar pattern of improvement was observed. The average pretest score of 72.4 increased to 86.9 on the posttest. The minimum score increased significantly from 45 to 75, while the maximum score increased from 90 to 98. This improvement indicates that students' abilities after the learning experience better development compared to before the learning (pretest < posttest). Furthermore, the standard deviation decreased significantly from 9.8 on the pretest to 4.7 on the posttest, indicating an increase in the uniformity of student learning outcomes after the learning implementation.

Overall, in both limited and extensive trials, the data showed a consistent increase in learning outcomes from pretest to posttest as well as a decrease in standard deviation, indicating that the applied learning not only increased students' average scores, but also made learning outcomes more evenly distributed.

After conducting descriptive analysis, statistical tests were conducted on the pretest and posttest data to determine implicit data regarding students' writing abilities. The results of these statistical tests are presented in the following table.

Table 4. Pretest and Posttest Data on Students' Writing Ability

Test	Limited Test		Extensive Trial	
	Mark	Information	Mark	Information
Pretest Normality Test	0.655	Normally Distributed	0,000	Not Normally Distributed
Posttest Normality Test	0.658	Normally Distributed	0,000	Not Normally Distributed
Paired Sample T-test / Wilcoxon Test	0,000	H0 is rejected, Ha is accepted	0,000	H0 is rejected, Ha is accepted
N-gain	0.49	There is an Improvement (Moderate)	0.51	There is an Improvement (Moderate)

Based on the data in Table 5, the results of the analysis of students' writing abilities in limited trials and extensive trials show an increase in writing abilities after the application of teaching materials based on the Synthetic Analytical Structure (SAS) model assisted by the Canva application.

In the limited trial, the results of the normality test showed that the pretest data obtained a significance value of 0.655 and the posttest data was 0.658, both of which were greater than 0.05. This indicates that the pretest and posttest data in the limited trial were normally distributed. Therefore, the hypothesis testing was conducted using the Paired Sample T-test. The test results showed a significance value of 0.000 (<0.05), so H_0 was rejected and H_a was accepted. Thus, it can be concluded that there is a significant difference between students' writing abilities before and after the use of SAS model-based teaching materials assisted by the Canva application.

Meanwhile, in the extensive trial, the results of the normality test showed a significance value of 0.000 for both the pretest and posttest data, which means the data were not normally distributed. Therefore, hypothesis testing was conducted using the nonparametric Wilcoxon Signed Rank Test. The results of the Wilcoxon test showed a significance value of 0.000 (<0.05), so H_0 was rejected and H_a was accepted. These results indicate that there is a significant difference between students' writing abilities before and after the implementation of teaching materials in the extensive trial.

Furthermore, the N-gain calculation results from the limited trial showed a value of 0.49, categorizing as a moderate improvement. In the extensive trial, the N-gain value of 0.51 also categorizing as a moderate improvement. This indicates that the use of SAS-based teaching materials with the Canva application consistently improved students' beginning writing skills across both trial stages.

Overall, the results of the analysis prove that the developed teaching materials not only provide statistically significant differences in students' writing abilities, but also provide an increase in initial writing abilities in the moderate category, both in limited trials and extensive trials.

Teacher and Student Obstacles in Implementing Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

Next, interviews with teachers and students were conducted to identify the challenges faced in implementing learning using the Synthetic Analytical Structure (SAS) model to improve elementary school students' early reading and writing skills. The data from these interviews are presented below.

Table 5. Results of Teacher and Student Interviews Regarding Obstacles

Respondents	Obstacles Faced
Student	Still having difficulty writing letters, writing at a slow speed, having difficulty connecting letters into words, and feeling that the teacher's explanation is too fast.
Teacher	Limited learning time.

Based on the interview results presented in Table 5, information was obtained regarding the obstacles faced by students and teachers in implementing learning using teaching materials based on the Synthetic Analytical Structure (SAS) model assisted by the Canva application. From the students' perspective, the most dominant obstacles were difficulty in writing letters correctly, slow writing speed, and difficulty connecting letters into words. In addition, some students also said that they felt the teacher's explanations were too fast, so they needed additional time to understand the material and complete writing assignments. These findings indicate that students' fine motor skills and early literacy readiness still vary, so a more flexible learning pace is needed, along with gradual and repeated writing practice.

From a teacher's perspective, the primary obstacle faced is limited learning time. The available time is perceived as insufficient to optimally accommodate all stages of SAS learning, particularly when providing individual support to students experiencing writing difficulties. This situation requires teachers to manage their time effectively and adapt learning strategies to meet the characteristics and needs of early grade students.

Overall, the results of these interviews indicate that obstacles to learning implementation stem not only from students' initial abilities but also from technical and managerial factors within the learning process. These findings serve as important evaluation material for refining teaching materials and implementing the Canva-assisted SAS model, particularly in terms of adjusting the learning pace, adding gradual writing exercises, and managing learning time more effectively to optimally achieve the goal of improving early reading and writing skills.

Discussion

The Process of Developing Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

The development of teaching materials based on the Synthetic Analytical Structure (SAS) model assisted by the Canva application in this study is in line with the characteristics of early reading and writing learning in early elementary school grades. The SAS model emphasizes learning from complete language structures to smaller elements, thus aligning with the cognitive development stages of first-grade students. The research findings show that digital visual integration through Canva can strengthen the structural, analytical, and synthetic stages in SAS without changing the model's essence. This supports the opinion of Suyanto (2023) who stated that early reading and writing learning will be more effective when presented in a concrete, visual, and contextual manner appropriate to the child's world.

The needs analysis results indicate that conventional learning, which lacks digital visual media, does not fully accommodate the learning styles of early grade students. Therefore, utilizing Canva as an interactive visual medium is a relevant solution. Canva allows for the presentation of text, images, colors, and simple animations that can increase students' attention and motivation to learn. This finding aligns with research by Oktaviani et al. (2025) , which states that the use of digital visual media in early literacy learning can increase student engagement and facilitate more meaningful letter and word recognition.

Expert validation of teaching materials, student worksheets (LKPD), learning media, and lesson plans (RPP) indicated that the developed product was considered feasible and very feasible to use. The validators assessed that visual reinforcement at each stage of the SAS actually clarified the language analysis and synthesis process for students. Revisions, such as simplifying the instructional text and adjusting the difficulty level of writing exercises, made the product more operational and user-friendly for early grade teachers. These findings support the findings of Waruwu (2024) , who emphasized that validation and revision in development research are essential steps in producing effective and applicable learning products.

The results of limited trials and field trials indicate positive developments in students' early reading and writing skills, as well as increased active engagement during learning. In the extensive trials, the diversity of student characteristics and teacher approaches actually created more lively and meaningful learning. This demonstrates that SAS-based teaching materials, supported by Canva, are flexible and adaptable to various classroom contexts. These findings align with research by Tauhid (2022) , which concluded that structural model-based learning supported by digital media can improve early literacy and create an active, harmonious, and student-centered learning environment.

The Feasibility of Teaching Materials with Synthetic Analytical Structure (SAS) Model Assisted by Canva Application to Improve Elementary School Students' Early reading and Writing Skills

The feasibility test results indicate that the teaching materials based on the Synthetic Analytical Structural (SAS) model assisted by the Canva application are in the very feasible category in all components, including teaching materials, LKPD, learning media, and RPP. This high percentage of feasibility indicates that the integration of digital visual media through Canva is able to strengthen the implementation of SAS syntax without eliminating its basic characteristics. This finding is in line with the research of Wulandari &

Anggraini (2025) which stated that the use of Canva-based media in early reading and writing learning is considered feasible and effective because it is able to present text and images in an interesting way and is in accordance with the characteristics of early grade students. In addition, Amanda et al., (2025) also emphasized that systematically designed Canva media received high validity from experts and practitioners, and supported the implementation of basic literacy learning in elementary schools.

The improvement in students' early reading skills, as seen in the observation results at each meeting, indicates that the implementation of Canva-assisted SAS teaching materials has had a gradual positive impact. In both limited and extensive trials, the average score and percentage of students' reading ability increased consistently from the adequate category to good and very good. This indicates that visualizing sentences, words, and letters through Canva helps students understand the reading process more concretely and systematically. This finding aligns with the research results of Ningrum et al. (2024) which stated that the use of Canva-based learning media can improve elementary school students' literacy skills because it presents material visually, contextually, and is easy for early grade students to understand.

The differences in achievement between the limited and extensive trials indicate the influence of student characteristics, the school environment, and variations in teacher approaches in implementing learning. Nevertheless, both trials showed a trend toward improving students' early reading skills. This indicates that the Canva-assisted SAS model is adaptive and applicable to diverse classroom contexts. This finding is supported by research by Purnamasari (2023) , which concluded that interactive learning media developed with student characteristics in mind can improve early literacy, even when applied to diverse classroom conditions.

Overall, the results of the feasibility test and observations of early reading skills prove that the SAS model-based teaching materials assisted by the Canva application are not only theoretically and technically feasible, but also effective in improving the early reading skills of first-grade elementary school students. The integration of visuals, text, and gradual activities in Canva supports the principles of concrete, gradual, and meaningful early literacy learning. Thus, the developed teaching materials have great potential for wider use as an innovative alternative in early reading and writing learning in elementary schools, as supported by various recent studies in the field of literacy and digital learning media.

The Effectiveness of Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

Teaching materials using the SAS model, assisted by the Canva application, are effective in improving students' reading and writing skills. The results of descriptive analysis in limited and extensive trials indicate an increase in students' beginning writing skills after the implementation of teaching materials based on the Synthetic Analytical Structure (SAS) model assisted by the Canva application. The improvement is seen in the increase in the average score, minimum score, and maximum score from pretest to posttest, as well as a decrease in the standard deviation, indicating that student learning outcomes are more evenly distributed. These findings indicate that beginning writing learning presented visually, gradually, and systematically can help students understand the process of forming letters, words, and sentences more effectively. These results are in line with Dewi's (2025) research , which states that the use of digital visual media in beginning writing learning can improve students' writing performance while reducing the ability gap between early grade students.

The statistical test results further strengthen these descriptive findings. In the limited trial, pretest and posttest data were normally distributed, so they were analyzed using the Paired Sample T-test. While in the extensive trial, the Wilcoxon test was used because the data were not normally distributed. Both statistical tests showed a significance value of 0.000 ($p < 0.05$), indicating a significant difference between students' writing abilities before and after the implementation of the teaching materials. These findings indicate that the integration of the SAS model with Canva media has a significant impact on improving students' initial writing abilities. These results are in line with the research of Yani et al. (2024) which concluded that the

implementation of a structured learning model assisted by digital media significantly improves the initial writing abilities of elementary school students.

Furthermore, the N-gain calculation results for both the limited and extensive trials were both in the moderate improvement category. This N-gain value indicates that although the improvement in students' writing skills has not yet reached the high category, the applied learning has provided a consistent positive contribution. This moderate improvement is influenced by the characteristics of early grade students who are still at the stage of fine motor development and basic literacy. This finding is in line with Meder's (2025) opinion , which states that the improvement in early writing skills in first grade students generally occurs gradually and requires repeated practice and strong visual support.

Teacher and Student Obstacles in Implementing Teaching Materials with the Synthetic Analytical Structure (SAS) Model Assisted by the Canva Application to Improve Elementary School Students' Early reading and Writing Skills

Interviews with students and teachers provide a contextual overview of these quantitative findings. Students' difficulties in writing letters, slow writing speed, and connecting letters into words indicate that the initial writing process still requires intensive guidance and flexible learning pacing. Meanwhile, teachers' perceived learning time constraints are a factor influencing the optimization of the SAS model implementation in the classroom. Nevertheless, these findings reinforce the relevance of using Canva in SAS learning because visual media can help teachers explain material more efficiently and make it easier for students to understand the writing stages. This aligns with research by Syafei (2025) , which states that digital visual media can save learning time and improve understanding of writing concepts in early grade students.

Based on the data analysis and discussion described above, it can be concluded that the teaching materials developed in this study using the SAS model, supported by the Canva application, have a positive impact on improving early reading and writing skills. This finding not only aligns with relevant theoretical foundations but also aligns with previous research that emphasizes the importance of contextual, interactive, and learner-centered learning. Therefore, the results of this study strengthen empirical evidence that innovation in the learning process is a crucial factor in improving the quality of learning. Therefore, the teaching materials developed using the SAS model, supported by the Canva application, are worthy of consideration as an alternative, effective and sustainable learning solution.

CONCLUSION

Based on the research and analysis results above, it can be concluded that teaching materials with the SAS model assisted by the Canva application were successfully developed systematically through the R&D stages, starting from needs analysis, design, development, expert validation, to limited and extensive trials. The results of the feasibility test showed that all components of the teaching materials, LKPD, learning media, and RPP were assessed as "Very Feasible" by the validators, so this product is valid and ready for use. The effectiveness of the teaching materials is proven by the increase in students' early reading and writing skills, shown through observation results and pretest-posttest which consistently increased in limited and extensive trials, with an N-gain value in the medium category. The obstacles encountered were mainly related to difficulties in writing letters, student writing speed, and limited teacher learning time, which became evaluation materials for improving implementation. Overall, this study proves that teaching materials based on the SAS model assisted by the Canva application are effective, practical, and able to support early literacy learning in an interesting, systematic, and contextual manner according to the characteristics of first grade elementary school students.

Therefore, it is recommended that future research further develop these teaching materials by integrating adaptive learning features, expanding their implementation to a wider range of schools and grade levels, and combining the SAS model with other interactive digital platforms to enhance effectiveness and sustainability. In addition, further studies may explore long-term impacts on students' literacy development and provide professional training for teachers to optimize the use of digital-based teaching materials.

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