



Development of Montessori-based teaching materials for slow readers (BASIBA) to improve students' reading skills

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Article Info

Article history:

Received February 01, 2026

Revised March 20, 2026

Accepted April 01, 2026

Available online May 20, 2026

Keywords: ADDIE model, Early reading, Montessori method, Slow readers, Teaching materials

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Abstract. This study aims to develop Montessori-based teaching materials called BASIBA (Low Reading Student Teaching Materials) to improve the early reading skills of first-grade students at MSI 14 Medono. The main problem is the high prevalence of slow readers, caused by a lack of literacy stimulation from parents, monotonous conventional learning methods, and teaching materials that do not suit children's cognitive and sensory needs. This study uses a Research and Development (R&D) approach, utilizing the ADDIE model, with a sample of 30 first-grade students. The analysis stage identified needs through observations and interviews with teachers, revealing that 10 students were unable to recognize letters, 12 had difficulty with double consonants, and only 8 were fluent readers. BASIBA was designed based on Montessori principles: multisensory, concrete, and gradual (letters, syllables, words, sentences), and it is equipped with student worksheets and guide barcodes. Validation by media and

materials experts gave a feasibility score of 93% and 93.75% (very feasible). The implementation of BASIBA improved students' early reading skills; the pretest score of 63.43 increased to 80.69, yielding an N-Gain of 0.4460 (44.6%). The teacher's response reached 96.25%, and students showed high enthusiasm. The novelty of the research lies in the development of structured Montessori-based teaching materials specifically for slow-reading students through a multisensory approach in a systematic printed format. This research provides a scientific contribution in the form of innovative early reading teaching materials as an inclusive learning solution to improve basic literacy in elementary schools.

Introduction

Early reading skills in elementary grades are crucial for students to access subsequent learning. However, most elementary students, particularly first graders, experience early reading difficulties, a condition known as slow reading. Slow reading is a condition in which students require more time to develop basic reading skills than their peers (Lestari et al., 2020). This occurs due to students' varying levels of intelligence and the mismatch between learning methods and their cognitive and sensory needs (Kirana et al., 2024). The problem of slow reading has a wide impact, for example, on academic achievement, learning motivation, self-confidence, and opportunities for further learning (Rahma & Dafit, 2021).

More broadly, reading literacy remains a challenge in the national education system (Widana et al., 2023; Salsabila et al., 2025). Data from the Programme for International Student Assessment, conducted by the Organisation for Economic Co-operation and Development, show that

Indonesian students' reading literacy remains below the OECD average (Zakiah & Sukmandari, 2024). This situation suggests that strengthening reading skills in the early grades of elementary school is a strategic step toward improving the quality of national literacy (Sari & Setiawan, 2023; Wedawati, 2023). Therefore, learning innovations are needed to accommodate the needs of students who have difficulty reading, including those classified as slow readers.

Preliminary research conducted at MSI 14 Medono revealed that all students at the school are required to participate in a reading class program. However, the classes are grouped based on the students' literacy levels, namely: (1) high group (already able to read, but still have difficulty with neat writing), (2) middle group (have difficulty pronouncing double consonants), and (3) low group (not yet able to read or write). The phenomenon of delayed reading ability is quite common in this school environment. Based on interviews with class teachers, the main difficulties in the low group come from a lack of literacy stimulation from parents and low student motivation to learn. Factors that exacerbate this condition include busy parental schedules, lack of communication between parents and the school, and students' reluctance to learn to read due to fatigue, difficulty, and laziness.

Mastery of early reading skills is a prerequisite for accessing knowledge in various fields of study. Field evidence indicates that some lower-grade students still experience reading difficulties (Nurmawati et al., 2023). Similar findings in a study at SD Negeri 61 Rejang Lebong, which noted the low percentage of students achieving basic reading competency, reflect the gap between curriculum expectations and the reality of learning. A learning approach aligned with the developmental characteristics of early childhood is needed to address this issue. The Montessori method offers a child-centered pedagogical framework that integrates sensorimotor experiences, manipulative media, and a structured learning environment, encouraging independent exploration. This approach supports not only cognitive development but also the affective and psychomotor aspects that underlie early literacy (Rambe et al., 2022).

In Indonesia, the application of the Montessori method in early reading instruction has shown positive results. Classroom action research at SD Negeri 2 Gemeksekti revealed an increase in first-grade students' reading ability from 65.53% (cycle I) to 86.31% (cycle III), confirming the relevance of this approach to the developmental stage of children aged 6-7 years. Experimental research shows significant improvements in early literacy components, including alphabet knowledge, phonemic awareness, and grapheme-phoneme correspondence after Montessori-based interventions (Widayati et al., 2025). Specific Montessori materials, such as sandpaper letters and the movable alphabet, have been shown to be effective in creating multisensory learning experiences that support the internalization of reading concepts in children aged 5-6 years (Ma'rifat et al., 2024).

Although numerous studies have examined the effectiveness of the Montessori method in early reading instruction, most have focused on its application in classroom activities or on the use of isolated media. Few studies have developed structured Montessori-based teaching materials specifically designed for slow-reading students. Therefore, this study fills this gap by developing BASIBA, a systematic, multisensory-based teaching material.

Students who experience slow reading difficulties require special open-ended materials designed to address these issues, such as anxiety, lack of desire to read, and poor phoneme and letter recognition. Addressing these issues requires an inclusive, personalized, and multisensory learning approach (Alifia et al., 2023). Based on this research gap, this study developed the Montessori-based Learning Materials for Slow Reading Students (BASIBA), designed in stages, starting from letter recognition, syllables, words, and simple sentences. This is a special medium designed to

support students with different reading speeds. BASIBA not only simplifies the content but also uses a concrete, sensory-based approach so that students can learn through sight, touch, and movement, aligned with the developmental characteristics of children aged 6-7 years. The Montessori method is highly relevant to integrating into BASIBA in this context.

The Montessori method is highly relevant for integration into BASIBA. This method emphasizes independent, concrete, and sensory-based learning. This is very suitable for slow readers. In the Montessori approach, students are given the freedom to choose learning aids that suit their interests and learning pace, making the learning process meaningful and enjoyable without pressure (Elisabeth Revika Hadrianti & Cicilia Novita Ayundasari Poto, 2025).

In addition, the Montessori approach supports the principle of inclusive education by requiring teachers to provide learning experiences accessible to all students, including those with learning difficulties (Saputra, 2025a). Slow readers can learn at their own pace while still feeling valued and motivated. BASIBA is a product innovation that integrates the advantages of Montessori with the special needs of slow learners in madrasas, and there are no other valid, practical, or effective teaching materials for this context. Through BASIBA, students not only learn to read but also develop their motor skills through activities such as cutting, tracing, bolding letters, matching pictures to words, and ultimately, reading fluency. This aligns with the values of the Montessori philosophy and addresses students' slow reading skills.

The ADDIE (Analysis, Design, Development, Implementation, Evaluation) model was chosen as the methodological framework for this study because it is well-suited to the primary research objective: developing valid and practical BASIBA (Learning Materials for Slow Readers) teaching materials. This model provides a systematic flow that ensures each stage of development is grounded in users' real needs, while enabling scientific validation and continuous improvement (Maeswaty et al., 2023). In the Analysis stage, an in-depth identification of the reading difficulties of first-grade students at MSI 14 Medono was conducted, including the causal factors and specific needs that formed the basis for the intervention design. The Design stage formulated the structure of the teaching materials by integrating the principles of the Montessori method through concrete materials, movement-based activities, and independent learning, as a pedagogical response to the characteristics of slow readers. During the Development stage, collaboration with classroom teachers and literacy experts was conducted to ensure the validity of BASIBA's content and pedagogy. The Implementation stage was conducted on a limited basis to assess the feasibility and practicality of using the teaching materials in real classrooms. Finally, the Evaluation phase includes response sheets from first-grade teachers and user feedback, as well as statistical analysis of BASIBA's learning outcomes in improving reading skills and gathering input for product improvement. Thus, the ADDIE-based Research and Development (R&D) approach explicitly supports the achievement of two key criteria for learning product development: validity and practicality (Fahmiyah et al., 2025).

Based on the description, the formulation of the research problem is: (1) what is the level of suitability of Montessori-based BASIBA for grade I students of MSI 14 Medono?; (2) how effective is Montessori-based BASIBA in improving the literacy of grade I students of MSI 14 Medono? This research was conducted in response to the urgent need for inclusive, contextual, and evidence-based literacy interventions in madrasas. The combination of the Montessori method and the systematic ADDIE model framework is expected to produce valid and practical teaching materials. This research strengthens inclusive education in madrasas, an area that has so far received less attention. The results of this research are expected to be beneficial to MSI 14 Medono and to serve as a reference for other madrasas. This research aligns with the national education vision that emphasizes equality and quality improvement. The success of literacy interventions in early grades

has long-term impacts on students' academic achievement. Every student, including slow readers, has the right to fair and meaningful learning opportunities. Therefore, this study will discuss the Development of Teaching Materials for Slow-Reading Students (BASIBA) using the Montessori Method to improve the Reading Skills of Grade 1 Students at MSI 14 Medono. The purpose of this study is to improve the initial reading skills of grade 1 students through the teaching materials that will be developed.

Method

Research Methods and Design

This type of research examines learning products that have been developed and the development model, or Research and Development (RnD). In developing teaching materials for slow readers, the ADDIE model is used for research and development (Yusuf, 2025). ADDIE is an acronym for Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen because it offers systematic, flexible stages that are well-suited for developing Montessori-based teaching materials.

Population and Sampling Techniques

This research was conducted at MSI 14 Medono Pekalongan for two weeks. This school was deliberately selected because it has a special reading program for first-grade students and already has supporting infrastructure, but this educational component has not been fully optimized. This research involved 60 first-grade students. In a limited population, the researcher selected 50% of the population, namely 30 students, as the sample. This approach is supported by (Ulva Putri Ramadani et al., 2025), which states that in a population of fewer than 100 people, a sample of at least 50% is considered adequate to maintain representativeness in basic education research. This sample size is considered adequate to represent class conditions and to assess the feasibility of the developed teaching materials. The research subjects were selected based on theoretical criteria aligned with the development objectives. The subjects were selected from first-grade students of MSI 14 Medono who participated in the reading class program and had the following characteristics: (1) were at the beginning reading stage; (2) showed deficits in recognizing letters; (3) participated in the intensification of reading learning organized by the school. These criteria were designed to ensure that the BASIBA trial targeted students who needed acceleration in their beginning reading skills.

Research Procedures

Analysis

At this stage, the researchers conducted a preliminary study to obtain data related to the school's actual conditions. They conducted observations and interviews to learn more about early reading skills in first grade and the teaching materials used at MSI 14 Medono. They also analyzed factors influencing slow-reading students, identified obstacles they faced, and considered teaching materials that could be used to improve students' early reading skills. They also evaluated various learning approaches that were potentially effective in addressing this issue. One approach deemed particularly suitable for this problem is the Montessori approach. This approach emphasizes experiential learning, sensorimotor skills, and student independence, which strongly supports early literacy development.

Design

The purpose of the design phase is to verify the desired performance and appropriate testing methods. This stage focuses on translating the identified needs into a structured development solution. First, the development objectives of BASIBA are formulated using the Montessori approach, ensuring that BASIBA's development is tailored to the language development of lower

grade students. The BASIBA media is designed to integrate several components: 1) material presented in the form of text, images, and animations to facilitate conceptual understanding, 2) student worksheets to reinforce mastery and provide feedback, and 3) barcodes to indicate the process and procedures for using BASIBA. The organization of BASIBA is designed based on Montessori principles and is contextually adapted for children aged 4-7, taking into account vocabulary relevant to their environment and daily life experiences.

Development

The development phase aims to produce and validate selected learning resources. The development phase involves generating content, selecting or developing supporting media, developing student guides, and so on. At this stage, researchers develop products to address existing problems. After the materials are prepared, researchers then develop a prototype of the product to be used. Development is carried out through two stages of expert validation: media experts and language experts, to test feasibility.

At this stage, the designed framework was transformed into a functional prototype using Canva as the primary platform, chosen for its accessibility and ease of use. The prototype underwent expert validation involving media and language experts. The media validation instrument used a four-point Likert scale to assess: 1) BASIBA size/format, 2) BASIBA cover design, 3) BASIBA content design, 4) BASIBA overall design, and 5) BASIBA supporting features. Meanwhile, the language validation instrument used a four-point Likert scale to assess: 1) content suitability, 2) material accuracy, 3) supporting materials, 4) presentation techniques, 5) presentation completeness, 6) language used.

Experts provided quantitative scores and qualitative feedback, resulting in revisions such as difficult language adjustments based on development and presentation balance. The development process followed an iterative cycle, where feedback from validators was integrated into classroom implementation.

Implementation

At this stage, the validated product is implemented in the classroom through a pre-test and post-test design to measure the improvement of students' reading skills. After being given a stimulus in the form of a reading book developed based on Montessori principles, taking into account the developmental characteristics of children aged 4-7 years and vocabulary relevant to everyday life, there was a significant improvement in students' reading skills. This is evidenced by positive responses from students and appropriate teaching methods.

Evaluation

The evaluation was conducted through two components: (1) response sheets from first-grade teachers and user feedback, and (2) statistical analysis of learning outcomes. The results showed that the developed media met the criteria for suitability for use in the classroom. Student questionnaire responses indicated that BASIBA was engaging, easy to use, and effective for independent learning. Meanwhile, teachers reported that BASIBA reduced the burden in class because students were already able to read, and increased student participation. Statistical analysis used descriptive statistics. This evaluation confirmed that the developed teaching materials were not only valid but also practical in improving students' early reading skills. The complete research procedure is shown in Image 1 below.

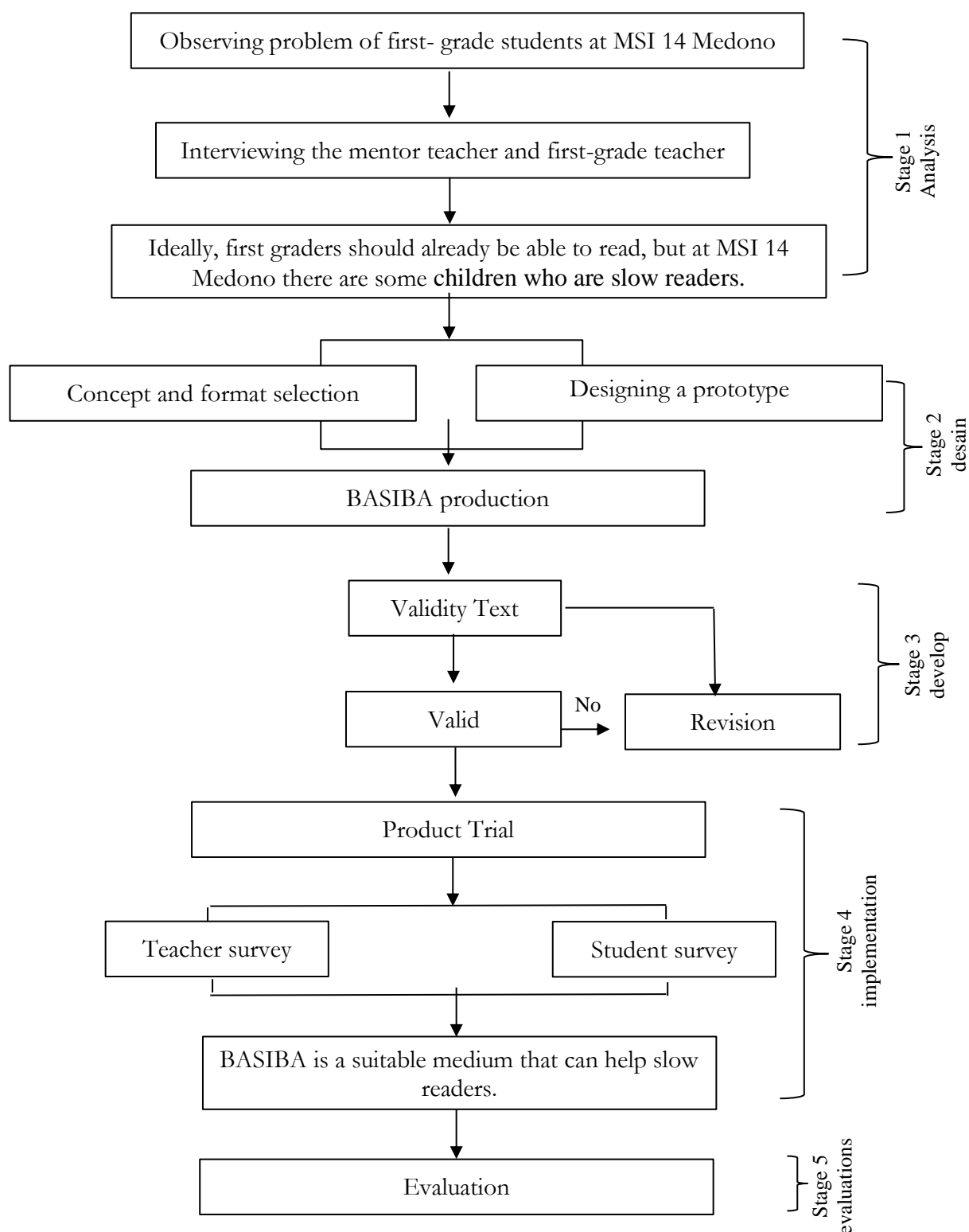


Image 1. Product development flowchart

Data Collection Techniques and Research Tools

The data collection instruments consisted of media and materials expert validation sheets, teacher and student response questionnaires, and reading ability tests (pretest-posttest). Observations and interviews were used in the analysis stage to identify reading learning needs, while tests were used

to measure students' beginning reading abilities through pretests and posttests. The questionnaires were used to obtain validation data from experts, teachers, and students regarding their responses to the developed teaching materials.

Testing the Validity and Reliability of the Tool

The instrument's validity in this study was assessed by two media and materials experts. Validation was conducted to assess the suitability of the indicators, the clarity of the language, and the relevance of the questions to the research objectives. The instrument's reliability was maintained through consistent indicators, a uniform rating scale, and consistent results across the validators, making it suitable and reliable for research.

Data Analysis Techniques and Criteria

This approach was chosen to ensure that the analysis results encompass both numerical and descriptive aspects in the development of learning media. Quantitative analysis was used to assess the feasibility of BASIBA and analyze student responses to the questionnaire. Qualitative analysis was used to interpret observations, interviews, and input from media and materials experts to improve BASIBA. Scores were then converted to percentages using the linear interpolation formula:

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

Information:

- P = Percentage score
- $\sum x$ = The number of respondents' answers to an item.
- $\sum x_i$ = Ideal score

The following are the eligibility criteria for this study:

Table 1. Eligibility Criteria

Interval (%)	Criteria
0% - 25%	Totally unsuitable
26% - 50%	Not suitable
51% - 75%	In accordance
76% - 100%	Very suitable

To analyze the results of improving student literacy, the researchers used the N-gain formula adapted as follows:

$$N\text{-Gain } (g) = \frac{\text{Post-test score} - \text{Pretest score}}{\text{Maximum score} - \text{pretest score}}$$

Information:

- N- Gain (g) = Gain factor value
- Posttest score = Final test score
- Pre-test score = Initial test score
- Maximum score = Maximum test score

Table 2. N-Gain categories can be seen in Table 2.

Hose	Category
$(g) \geq 0.7$	High
$0.3 < (g) \leq 0.7$	Currently

$(g) < 0.3$	Low
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Then, the average N-Gain index score is converted into percentages categorized based on the interpretation of the N-Gain test, as shown in the following table:

Table 3. Criteria for N-Gain literacy improvement levels:

Percentage (%)	Criteria
< 40	No improvement
40 - 55	A slight improvement
56 - 75	Medium repair
≥ 76	Improvement

In addition, a paired t-test was conducted to determine the significance of the differences between the pretest and posttest results using the formula:

$$t = \frac{\bar{d}}{\frac{sd}{\sqrt{n}}}$$

Information:

- \bar{d} = average difference (posttest- pretest)
- sd = standard deviation of the difference
- n = number of samples

Product Specifications

The product developed is the Slow Reading Student Teaching Material (BASIBA) as a learning medium to improve students' early reading skills. BASIBA is Montessori-based, with motor skills through activities such as cutting, tracing, bolding letters, matching pictures to words, and ultimately, fluent reading.

Results and Discussion

This research aims to design and evaluate teaching materials to improve students' early reading skills. The development process follows the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. Each stage produces findings that contribute to the product's feasibility.

Analysis

Interviews with first-grade teachers at MSI 14 Medono revealed that the learning environment for students in the supplementary reading class was not conducive. The first-grade teacher reported that the students were restless during the supplementary class, with many students running around while waiting for their turn to read. Regarding the reading instructional method, the teacher explained that the method used so far was spelling.

Regarding teaching materials, the first-grade teacher stated that the materials used were not self-developed but were purchased reading exercise books. While sections of the textbooks used have been quite helpful so far, students often get bored with them. Additional reading classes are held only twice a week, on Thursdays, during the first and second weeks. Furthermore, based on the number of students experiencing reading difficulties, the first-grade teacher stated that there are 30 students in the first grade, and each student is grouped by reading level. The high-level class consists

of students who can read fluently but still have difficulty writing neatly, the middle-level class consists of students who have difficulty pronouncing double consonants, and the low-level class consists of students who are not yet able to read and write. The main challenge teachers face in supporting supplemental reading classes is low student focus. This is influenced by several factors, as a first-grade teacher noted, such as busy parents who cannot accompany their children to study, some parents and students who do not want to be recommended for tutoring, and a lack of support from the surrounding community.

Observations of 30 first-grade students at MSI 14 Medono and interviews with classroom teachers revealed that some students struggled to master basic reading skills. Ten students were unable to consistently recognize vowels and consonants, had difficulty distinguishing between printed letters, and were slow to string syllables together to form complete words. Twelve students recognized letters but struggled to pronounce consonant endings and double consonants. Eight students read fluently. These conditions indicate significant delays in early literacy. Although the school has implemented a specialized reading program, there is a shortage of reading resources. These findings reinforce the urgency of developing teaching materials that are appropriate to the learning characteristics of slow readers in regular classrooms. The researchers' teaching materials are called Teaching Materials for Slow Readers (BASIBA).

The teaching materials used in first-grade reading lessons are conventional, consisting of text-based printed modules with minimal visual elements, color, and interactive activities. Interviews with teachers revealed that these materials were not specifically designed to support students with reading delays, making them difficult to modify to accommodate the diverse learning speeds in the classroom. As a result, the learning process tends to be uniform and unable to meet the needs of students who require a more concrete and repetitive approach. The lack of adaptive teaching materials is a major obstacle to improving early reading skills. External factors, such as a lack of literacy stimulation at home, limited access to children's books, and the dominance of teacher-centered teaching methods, further exacerbate students' reading delays (Ajrianingrum & Badarudin, 2024).

Observations show that students are more responsive to activities involving touch, movement, and visuals than to passive book reading. Based on these findings, researchers developed Slow Reader Teaching Materials (BASIBA) based on the Montessori approach, which emphasizes independence, multisensory learning, and structured repetition. BASIBA is designed with student worksheets that allow students to actively and enjoyably build phonemic understanding. This development is expected to meet the learning needs of slow readers in elementary schools.

Design



Image 2. BASIBA cover design

The design produced at this stage serves as a guideline for the development process. The researchers formulated development objectives based on findings from the field, namely, to create teaching materials that are responsive to the learning characteristics of slow-reading students in first grade (Pradana & Wahyudi, 2025). The design process began with the preparation of a concept map of introductory reading teaching materials, organized into stages, starting with letter recognition, syllable combination, and simple sentence formation. The product design included physical formats, such as worksheets and learning flows, that enabled students to learn independently or with guidance. All components were designed to be easily operated by teachers without special training. This stage also involved developing success indicators and testing methods to be used in the evaluation phase (Mizan et al., 2025).



Image 3. BASIBA Design

BASIBA's design explicitly adopts Montessori principles, which emphasize active, multisensory, and child-centered learning. According to Anggrian & Saefurahman (2025), early childhood development occurs through direct interaction with concrete environments, so learning materials must be designed to be tactile, movable, and repeatable as needed. Therefore, BASIBA is equipped with physical aids, such as barcodes, that visually and tactilely link sound and meaning. Researchers developed teaching materials in the Canva app using the Montessori method. The design is based on the characteristics of self-directed learning, sensory stimulation, and a structured, aesthetically pleasing learning environment. The design of these teaching materials is attractive and simple, using neutral colors and realistic illustrations that support children's focus. Each visual component is designed according to the developmental stage of early childhood, encouraging independence and facilitating conceptual understanding through concrete experiences, in line with Montessori's child-centered philosophy (FR Saputra, 2025).

Development



Image 4. Revision by subject matter experts

At this stage, the designed framework was transformed into a functional prototype using Canva as the primary platform, chosen for its accessibility and ease of use (Zuhri & Ngatmini, 2024). The prototype has undergone validation by experts in media and materials.

Table 4. Results of the Validity Test of the Material and Media Expert Instruments

Expert validation	Assessment aspects	Total score	Maximum score	Percentage	Eligibility
Media validity	Product size	22	24	91.6%	91.51%
	Cover design	13	16	81.25%	
	Content design	35	36	97.2%	
	Overall design	16	16	100%	
	Supports display	7	8	87.5%	
Content validity	Content suitability	35	44	79.5%	93.16%
	Presentation suitability	20	20	100%	
	Language compatibility	16	16	100%	

Expert validation data were obtained from two validators: a media expert and a linguist. The validation instrument used a 1–4 Likert scale. Data were analyzed descriptively and quantitatively by calculating the feasibility percentage. The results showed that the media validator gave a feasibility score of 91.51% (very feasible), while the material validator gave a score of 93.16% (very feasible). The average product feasibility was 92.33%, so the prototype was deemed highly feasible for testing in the next stage. Minor revisions were also made based on narrative input from both experts, particularly regarding illustration layout and vocabulary selection.

After being validated by experts and revised, the next step was a trial involving 30 students. The trial aimed to improve students' early reading skills. Afterward, the researchers observed the students using a questionnaire. The final step in the development phase was an effectiveness test using a single-group pretest-posttest design. Observations showed that students were very enthusiastic about participating in the supplementary reading class using BASIBA media. BASIBA media was considered capable of facilitating students' early reading skills.

Implementation

Table 5. BASIBA feasibility indicators

No.	Indicator
1.	Can read the alphabet with correct pronunciation
2.	Can read vowels and consonants correctly
3.	Can read syllables
4.	Can read words
5.	Can read complete sentences clearly and fluently.

The validated BASIBA was implemented in the classroom with the aim of introducing and distributing the product, which had been declared feasible and practical, to a wider audience. At this stage, the researcher conducted counseling in the first grade of MSI 14 Medono. During the counseling activities, the researcher observed the students' progress. During the implementation phase, the researcher demonstrated the material to the students in class. The students responded enthusiastically to BASIBA.



Image 5. BASIBA Demonstration

The implementation of learning materials specifically designed for slow readers in first grade at MSI 14 Medono showed significant progress in mastery of basic reading skills. Before the use of learning materials specifically for slow readers, most students had difficulty recognizing letters, pronouncing phonemes, and stringing together syllables. These are common characteristics of early literacy delays (Andini & Ahmadi, 2024; Citrawan et al., 2024). However, after using systematic, visual, and progressive learning materials throughout the implementation period, there was a gradual improvement in the five key aspects of reading ability.

First, students can read the alphabet with correct pronunciation, which is an important foundation for early literacy. Teaching materials are designed with a Montessori approach to strengthen phonemic understanding. Each letter is presented with contextual illustrations relevant to students' daily lives, for example: A for Apple, B for Book. This is in line with the Montessori approach, which connects real-life experiences and contexts, enabling children to learn actively, enjoyably, and easily remembered (FR Saputra, 2025).

Second, students accurately identify and pronounce vowels and consonants phonemically. The teaching materials are systematically designed by separating vowel and consonant learning into structured modules, starting with mastery of short vowels (a, i, u, e, o) as a phonological foundation, followed by basic consonants (b, c, d, and so on). This approach refers to the principle of gradual phonics instruction, which has been shown to be effective in building phonemic awareness in the early stages of literacy (Widana & Ratnaya, 2021; Suryaningsih et al., 2025). Simple phonics-based, repetitive practice enables students to accurately distinguish and produce the sounds of each phoneme, especially for phoneme pairs prone to perceptual confusion, both visually (e.g., b–d, p–q) and auditorily (e.g., f–v, s–z).

Third, students can read syllables independently. Through gradual practice of combining letter sounds, for example, combining b and a to form "ba," students begin to understand the principle of sound analysis. The teaching materials use different colors for vowels and consonants, helping students visualize the process of sound integration. This activity has been shown to be effective in developing phonological skills, which are the foundation for word reading.

Fourth, students begin to read whole words consisting of two to three syllables. Contextual repetition in short sentences strengthens automatic word recognition while building students' confidence. Students begin to read words containing double consonants and nasal letters. Initially, students often experience slight articulation difficulties in pronouncing these phonemic structures. However, through different letter-coloring, they gradually internalize these phonological patterns

and can pronounce them more accurately and fluently. This becomes intrinsic motivation for further development of reading skills (Jaya et al., 2025).

Finally, the most important achievement at this stage is the students' ability to read complete sentences clearly and fluently. Although the sentences used are still simple (3–5 words), students show improvements in fluency, intonation, and comprehension of meaning. This marks the transition from reading as word decoding to reading for meaning, a crucial stage in early literacy development (Fahmiyah et al., 2025; Wijaya et al., 2025; Nadifa, & Zulvani, 2024). These findings reinforce the idea that implementing BASIBA for the needs of slow readers can address early literacy barriers in lower grades. At MI 14 Medono, this approach not only improves technical reading skills but also stimulates students' interest and active participation in daily literacy activities. Thus, the developed teaching materials are proven to be feasible, valid, and practical as pedagogical solutions for students experiencing reading delays in early grades. This is evident from the results of questionnaires conducted by teachers and first-grade students.

This experiment was conducted with 30 students, accounting for heterogeneity in reading abilities, especially among those who are slow to master basic reading skills. The implementation system was designed in a structured manner: each student reads one by one in front of the teacher, while other students waiting for their turn are given Student Worksheets (LKPD) as an integral part of BASIBA (Teaching Materials for Slow Readers). LKPD was developed thematically, contextually, and concretely in accordance with Montessori principles to maintain focus and active engagement during the learning process.

Table 6. Paired Samples Statistics

		Mean	N	Standard Deviation	Std. Error Mean
Pair 1	Pretest	63.43	30	9.235	1.686
	Posttest	80.63	30	4.453	.813

Based on the data analysis in the table above, a picture of student learning outcomes was obtained before and after the implementation of BASIBA. The average (*mean*) value of the sample (N=30) experienced an elevation from 63.43 (*pre-test*) to 80.63 (*post-test*), reflecting a difference in improvement of 17.20 points. The decrease in the standard deviation from 9.235 to 4.453 confirmed the homogeneity of the distribution of student abilities after the intervention. This descriptive finding indicates that the developed product initially had a positive impact on students' initial reading skills. Statistical validation of the significance of the increase in initial reading skills.



Image 6. Students reading BASIBA

was carried out through the *Paired Sample T-Test*.

Table 7. Paired Sample Test

		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Mean	Standard Deviation	Std. Error	Lower	Upper				
Pair 1	Pretest - Posttest	-17.200	8.747	1.597	-20.466	-13.934	-10.770	29	.000

Based on the results of the paired sample T-Test, the t value was obtained *hitung* of 10.770 with a degree of freedom (df) of 29. The test results show a significance (2-tailed) of 0.000. Because the significance value is smaller than the specified significance level ($\alpha = 0.05$ atau $0.000 < 0.05$) (Mardiah et al., 2025). The null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. This statistically proves that there is a significant difference between the results of initial reading skills before and after using BASIBA.

Evaluation

The evaluation phase assesses the quality of the product and the learning process, both before and after implementation. Researchers must evaluate the media they have developed. The evaluation phase is conducted through two components: (1) expert validation and user feedback, and (2) statistical analysis of learning outcomes. The validation results indicate that the developed media are highly suitable for classroom use. Student questionnaire responses indicate that BASIBA is interesting, easy to use, and effective for independent learning. Meanwhile, teachers reported that BASIBA can reduce classroom workload because students are already able to read and increase student participation.

Table 8. Responses from assistant teachers and grade I teachers

Teacher's answer	Assessment aspects	Total score	Maximum score	Percentage	Eligibility
First-grade teacher	The appeal of BASIBA's appearance	28	28	100%	93.4%
	Ease of use of BASIBA	7	8	87.5%	
	Accuracy and usability of BASIBA	19	20	95%	
	Material accuracy	7	8	87.5%	
	Adherence to Montessori principles	16	16	100%	
	Use of language and writing	21	25	84%	
	Completeness and clarity of material	12	12	100%	
First-grade teacher assistant	The appeal of BASIBA's appearance	28	28	100%	96.3%
	Ease of use of BASIBA	8	8	100%	
	Accuracy and usability of BASIBA	19	20	95%	
	Material accuracy	7	8	87.5%	
	Adherence to Montessori principles	16	16	100%	
	Use of language and writing	23	25	92%	

Completeness and clarity of material	12	12	100%
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Teachers' assessments of the BASIBA learning materials received high scores across six aspects. Classroom teachers and assistant teachers concluded that the product was highly feasible, with an average feasibility percentage of 95.3%. This figure reflects the very positive reception by classroom teachers and assistant teachers, while also strengthening BASIBA's pedagogical validity as a learning material that is not only feasible but also consistent with the Montessori approach of creating a structured, independent learning environment that is responsive to the individual needs of students, especially those who require a step-by-step approach to mastering basic literacy (Nurriza et al., 2024; Zaeni et al., 2025; Bernadetha et al., 2024).

Table 9. N-Gain Test Results

	N	Minimum	Maximum	Mean	Standard Deviation
Ngain_Score	30	.12	.79	.4460	.17335
Gain_percent	30	11.54	78.95	44.5990	17.33523
Valid N (listwise)	30				

The average N-Gain score obtained was 0.4460 or 44.6%. Based on the N-Gain interpretation criteria, this figure indicates that students' early reading skills improved, falling into the moderate category. This finding is highly relevant to the Montessori approach, which emphasizes independent learning, sensory engagement, gradual structure, and concrete materials. Thus, BASIBA is not just a teaching tool, but a contemporary manifestation of Montessori principles that are adaptive to the context of elementary learning in formal schools.

Interpretation of this study's findings must be placed within the context of inherent methodological limitations. The limited sample size of 30 students in a single study site limits the external generalizability of the results to a more heterogeneous population. The adoption of a *one-group pretest-posttest* design without a control group also limits the study's internal validity, particularly in isolating the pure effects of the BASIBA intervention from covariate variables such as student maturation or parallel learning interactions. Furthermore, the absence of long-term measurements precludes verification of students' retention of reading skills post-intervention. Discussion of these limitations is intended to provide an empirical foundation for future research adopting a more rigorous design with a more representative sample.

The findings on the effectiveness of the BASIBA product in this study need to be interpreted taking into account several methodological limitations and the implementation context. First, the one-group pretest-posttest design used did not include a control group, thus limiting the study's ability to isolate the pure effects of the intervention from external variables such as students' natural maturation or the influence of parallel conventional learning. Second, the study sample was limited to 30 first-grade students at MSI 14 Medono, who have specific demographic characteristics and learning cultures. This condition limits the study's external validity, so generalizing the results to other elementary school student populations, especially those outside the madrasah ibtidaiyah context or in different geographic areas, must be done with caution. Third, impact measurements were conducted only immediately after the intervention (immediate post-test), without a delayed post-test, so long-term retention of students' reading skills cannot be verified. Therefore, claims of BASIBA's effectiveness should be limited to the context of improving early reading skills for students with similar characteristics in elementary education settings with profiles similar to the study location.

Conclusion

The BASIBA product was shown to be effective in improving the early reading skills of first-grade students at MSI 14 Medono. These findings imply that BASIBA is suitable for teachers to adopt as both a diagnostic assessment instrument and a remedial intervention for the early management of reading difficulties. However, the generalizability of the findings is limited by the single-sample design and the absence of a control group. Positive responses from teachers and students confirm the product's suitability for use in inclusive learning. This study provides a significant contribution to the development of contextual teaching materials in madrasas and strengthens the implementation of inclusive education that is responsive to the diversity of student learning speeds. Future research is recommended to adopt a quasi-experimental design with a larger sample and longitudinal measurements to assess the intervention's retention of impact.

Acknowledgements

The author would like to express his deepest gratitude to God Almighty for His abundant blessings and guidance, which enabled this research to be successfully completed. On this occasion, the author would also like to express his sincere gratitude and high appreciation to MSI 14 Medono for their full support, facilities, and meaningful cooperation throughout the research process. The author would also like to thank the supervisor who patiently, wisely, and dedicatedly provided guidance, direction, and constructive input, enabling this research to be well organized. Last but not least, the author would like to thank his beloved family, who always provided prayers, moral support, and unwavering encouragement at every stage of the writing process. The author would also like to thank the extended family of UKM F Literacy Education and Racana UIN KHAbdurrahman Wahid Pekalongan, who have been a source of inspiration, a place to share knowledge, and a source of motivation in the development of literacy and academic enthusiasm. May all contributions and goodness that have been given become good deeds and receive the best reward from Him. Amen, O God of the Universe.

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