

Enhancing Early Reading Skills in Elementary Students with Learning Difficulties Through RTI-Based Moveable Alphabet Media

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ABSTRACT

Early reading difficulties among first-grade students can hinder academic success if not addressed promptly. This study explores the effectiveness of a Response to Intervention (RTI)-based moveable alphabet media in improving early reading skills among students with learning difficulties in an Indonesian elementary school. The study employed Classroom Action Research (CAR) using the Kemmis and McTaggart model across two cycles. Eight first-grade students at Anugerah Abadi 2 Bengalon Elementary School, identified with early reading challenges, participated in the intervention. The RTI-based instruction incorporated multisensory learning through the use of moveable alphabet media. Data were collected using observations, pre- and post-tests, and documentation. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed thematically. The average reading ability increased from 30% in the pre-cycle to 67.5% in Cycle I and 92.5% in Cycle II. Initially, none of the students met the success criteria ($\geq 80\%$), but by Cycle II, all students achieved it. Observations indicated increased student engagement, motivation, and independence in reading activities. The findings suggest that integrating multisensory media with the RTI framework significantly enhances early reading skills in students with learning difficulties. The structured and individualized approach allowed for targeted interventions based on ongoing assessments. The study supports the effectiveness of hands-on, differentiated instruction grounded in constructivist and multisensory learning theories.

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1. INTRODUCTION

Early reading skills are basic skills that students must master in the early stages of primary education, especially in the first grade of elementary school. Reading activities are not limited to letter recognition, but also include decoding skills, or the process of transforming written symbols into meaningful sounds. (Tantri, 2016). At this early stage, reading requires coordination between the phonological system (awareness of sounds), the visual system (identification of letters and words), and motor skills (eye and hand movements

in following the text). These three components play an important role in forming the foundation of basic literacy (Birsh & Carreker, 2018; Ehri, 2005; Share, 1995).

However, the reality on the ground shows that many students still experience obstacles in learning to read from an early age (Annala & Safran, 2023; Cholifah & Utama, 2024; Gedik & Akyol, 2022). Initial observations in the first grade of Anugerah Abadi 2 Bengalon Elementary School show that some students are unable to recognize letters, combine sounds into syllables, and even make mistakes in pronouncing or writing simple words. These findings indicate disturbances in phonological and visual processing, which, if not immediately addressed, could hinder academic achievement in subsequent grades.

Although reading is a fundamental skill of great importance, students' reading abilities in Indonesia still face various challenges (Rahma et al., 2024; Setiyadi et al., 2025). Based on the Program for International Student Assessment (PISA) survey conducted by the Organization for Economic Cooperation and Development (OECD), Indonesian students' reading skills are below the international average. In 2012, Indonesia ranked 64th with a score of 375. In 2015, the score increased to 403, but Indonesia remained in 64th place. Then, in 2018, Indonesia's ranking dropped to 74th with a score of 371. This is very unfortunate. PISA 2022 showed an improvement in Indonesia's ranking to 68th. However, the reading score actually decreased to 317. The latest data from PISA 2023 shows a slight improvement in Indonesian students' reading scores to 321, bringing the country's ranking up to 66th. Despite the improvement in ranking, this score is still far below the international average of 476. This trend indicates that while there has been some improvement year over year, Indonesian students' literacy skills still require serious attention.

This is due to several factors, such as low levels of enjoyment of reading among students, insufficient application of reading metacognition strategies, and an classroom discipline environment that is not yet optimal (Afriatama & Sapri, 2023). The importance of comprehensive efforts to improve reading skills, whether through educational policies, the use of innovative learning media, or the active role of teachers and parents in supporting student literacy, shows that Indonesian students' reading literacy is still far from optimal (Fuchs & Fuch, 2006).

The assessment conducted at Anugerah Abadi 2 Bengalon Elementary School showed that some first-grade students had low early reading skills. Of the 41 children in the first grade, 9 were already fluent readers, 24 were familiar with letters and could read syllables, while 8 students still had difficulty recognizing letters. Students are still struggling to read syllables with consonant-vowel structures. This lack of basic reading skills makes it difficult for teachers to deliver lessons in the classroom. Evaluation results in learning have also declined because the 8 students mentioned earlier need to have their questions read aloud by the teacher.

Sometimes, the students can focus, but they are often distracted by their peers who can already read. Multiple-choice questions are also quite challenging because some students do not yet know the letters a, b, or c, leading them to answer questions randomly. Tests can yield good results if students answer orally. This is because the students have no cognitive difficulties; they simply have low reading skills. However, if teachers always conduct evaluations orally, this will take a lot of time because they have to test students one by one. Some factors causing students' learning difficulties include a lack of affection from parents, illiterate parents, too many students in one class, a lack of motivation to learn, and a lack of interesting and effective learning media.

To address these issues, data-driven intervention approaches such as Response to Intervention (RTI) are considered highly appropriate for implementation. RTI is a tiered intervention model that combines continuous assessment with the implementation of intensive and individualised learning strategies tailored to students' needs (Fuchs & Fuch, 2006). Response to Intervention (RTI) is a systematic approach in education designed to identify, prevent, and address student learning difficulties early on through tiered interventions. This model emphasizes the importance of continuous assessment and the use of learning outcome data to determine the level of support needed by students. RTI consists of three levels of service: general intervention provided to all students (Tier 1), additional intervention for students showing difficulties (Tier 2), and intensive and individualized intervention for students requiring specialized support (Tier 3) (Fuchs & Fuch, 2006). This approach not only functions as an

intervention strategy but also as an early identification tool for students at risk of learning disorders, enabling teachers to provide more appropriate, targeted, and student-centred learning services (Abou-Rjaily & Stoddard, 2017; Zhang et al., 2023). Thus, RTI plays a crucial role in enhancing the effectiveness of learning and ensuring that every student receives fair and optimal learning opportunities.

In practice, multisensory learning media such as the moveable alphabet, which consisted of physical letters that could be moved around and arranged by students, was used to help students understand the connection between letter symbols and sounds in a tangible way. The use of this medium aligned with the principles of the Montessori method and had proven effective in supporting the learning process of students with learning difficulties, as it involved the simultaneous coordination of visual, auditory, and motor senses (Hasibuan, 2024). This approach was also supported by constructivism theory, which emphasized that learners built their own knowledge through active interaction with their environment and meaningful learning experiences.

Previous research has shown that the effectiveness of the movable alphabet in early reading instruction has significantly improved letter recognition, word reading, and simple sentence comprehension compared to students who learn using conventional methods (Pattiwael et al., 2024; Rahmawati et al., 2025; Sari et al., 2024). In addition, students feel more confident and motivated to learn. Seeing this potential, research on the influence of using movable alphabet media on early reading skills is very relevant to conduct. The use of movable alphabet media is combined with an RTI or Response to Intervention-based approach. RTI aims to detect and overcome students' learning difficulties early on (Octaviani et al., 2025). Providing structured interventions based on student needs can prevent academic failure and optimize learning outcomes. Using the RTI framework, students can be classified according to their needs and receive more effective learning.

It is believed that the application of RTI using movable alphabet media can improve the expected results (Borzekowski et al., 2019; Nazarnia et al., 2023; Oralbayeva et al., 2024). Although previous research has demonstrated the effectiveness of the moveable alphabet in improving early reading skills, most studies have applied this medium in a general classroom setting or within the Montessori framework without systematically integrating it into a structured intervention model. Similarly, while the Response to Intervention (RTI) approach has been widely recommended for addressing learning difficulties, limited studies have examined its practical application in combination with multisensory media for first-grade students with early reading challenges. What is missing in current approaches is an evidence-based model that merges RTI with multisensory tools such as the moveable alphabet to provide tiered, data-driven, and individualized support. This study addresses that gap by implementing an RTI-based moveable alphabet intervention specifically targeted at students with early reading difficulties, thereby offering a concrete strategy that unites theory and practice in improving literacy outcomes in the early grades.

2. METHODS

This study uses Classroom Action Research (CAR). CAR is part of action research aimed at improving classroom learning practices through a cycle of actions involving collaboration between education practitioners (teachers, principals, students) and researchers. Classroom Action Research (CAR) is a type of research that aims to solve practical problems within the classroom by implementing planned actions and reflecting on those actions (Afandi, 2014). This study uses a research model developed by Kemmis & Mc. Taggart. Basically, the Kemmis & Mc. The Taggart model is an extension of Kurt Lewin's model, with the difference being the combination of the action and observation stages into a single unit. These two stages are combined because implementation and observation are two activities that must be carried out at the same time. This model is well-known for its continuous cycle, which provides opportunities for ongoing evaluation and improvement in the research process.

This study aims to improve early reading skills in children with learning difficulties in the first grade at Anugerah Abadi 2 Bengalon Elementary School through the use of RTI-based Moveable Alphabet media. This media is expected to improve students' ability to recognize letters, combine syllables, and read simple words, utilizing the principles of the Response to Intervention learning model, such as early problem identification, data-driven approaches, intervention provision, and teaching tailored to students' needs. In implementing this action research, the researcher planned, conducted, and reflected on each cycle carried out. Collaboration between the researcher and the parents of the students is crucial in creating a better learning environment and improving learning outcomes.

This research was conducted in the second semester of the 2024/2025 academic year, from April to May 2025. The subjects and their characteristics were selected based on the monitoring of first-grade teachers during early reading activities. Students who showed difficulties such as delays in recognizing letters, difficulty pronouncing words, or inability to follow oral and written readings were noted as subject candidates. Classroom teachers completed a brief questionnaire designed to evaluate non-academic aspects, such as reading motivation, focus during learning, and response to instructions or assistance. Students exhibiting two or more indicators of difficulty based on the three data sources above were designated as research subjects. Selection was conducted purposively, considering readiness for intervention and specific learning needs. Based on the teachers' observations, the subjects in this study were determined to be 8 (eight) students. The students were selected as samples because they had a beginner reading level that had not yet reached the expected indicators, so they needed more intensive services to improve their reading skills through the use of the Moveable Alphabet media. The characteristics of these 8 students were quite diverse, as follows.

Table 1. Subject Characteristics

No.	Subject	Characteristics
1.	RS	He has memorized some letters and can pronounce some syllables. Sometimes he reads by guessing.
2.	MG	Only knows a few letters and the letters that make up his name. Motivation to learn to read is very low.
3.	MF	Often forgets the shape of letters. Has difficulty focusing during lessons. When oral assessments are conducted, they must be read aloud multiple times. Is unable to read syllables (consonants and vowels).
4.	FNI	Already knows some letters and has difficulty recognizing letter sounds. However, often guesses at readings. Motivation to learn is also low.
5.	KYP	Already knows letters, difficulty recognizing sounds, difficulty pronouncing words, low motivation to learn.
6.	MSAF	Already knows some letters, can pronounce some syllables, lacks focus, low motivation to learn.
7.	IK	Only knows a few letters and the letters that make up his name. Often confuses the letters b, d, and p. Cannot combine two letters to form a syllable. Low motivation to learn. Difficulty accepting instructions or help from teachers.
8.	NZP	Difficulty recognizing letters and unable to pronounce words. However, has a strong desire to learn.

The action scenario to be implemented in this study consists of planning, implementation, observation, and reflection. Each meeting is conducted using the RTI approach, whereby eight students (small groups) receive additional learning after school. The action scenario for this study is described as follows

2.1 Cycle I

a. Planning

- (1) Formulate problems that exist in the classroom after observing 8 students with problems.
- (2) Determining indicators of early reading proficiency based on expert opinion
- (3) Prepare a movable alphabet by purchasing it online.
- (4) Developing teaching modules and learning tools (teaching materials, supporting images, and evaluation questions)
- (5) Prepare observation sheets to be used to observe student activities and reflect on the learning conducted by teachers.
- (6) Requesting permission from the school principal to conduct this research

b. Action

The implementation stage is the application of the previously prepared plan. The researcher acts as a teacher and conducts independent learning using the movable alphabet media. The learning activities take place after school hours, where eight students as subjects will receive additional hours after their friends have gone home. These activities consist of an introduction, core activities, and closing activities.

a) Preliminary activities

- 1) Students participate in a group prayer.
- 2) Students listen to the teacher explain today's activities.
- 3) Students and teachers sing the song "abc."

b) Core Activity

- 1) Each student is given a moveable alphabet.
- 2) Students say the names of the pictures shown by the teacher
- 3) The teacher takes a letter from the board.
- 4) Students imitate the sound of the letter spoken by the teacher.
- 5) Students take two letters (a consonant and a vowel).
- 6) Students sound out the two letters, imitating the teacher
- 7) Students arrange the movable alphabet letters according to the letters on their picture cards
- 8) Students write the letter shapes on paper
- 9) Students complete the missing letters to form words using the movable alphabet

c) Closing Ceremony

- 1) Students answer evaluation questions calmly
- 2) Students listen to the teacher's reflection on today's lesson
- 3) Students respond to greetings and pray after the lesson

c. Observation

This observation stage consists of observing the learning process. The researcher conducts the observation using an observation sheet that has been prepared. This observation is carried out to determine the smoothness of the learning process using RTI-based moveable alphabet media.

d. Reflection

Reflection in this study analyzes the results of observations made by the researcher. The analysis of the observation results was carried out by the researcher, who also acted as a teacher in this study. The results of this analysis were used to determine what had been achieved and implemented in this classroom action research. In addition, the results of this

analysis were also used to identify shortcomings and failures during the action. Finally, the results of the reflection were used as the basis for improvements in the next cycle.

2.2 Cycle II

Cycle II is an improvement on cycle I. The learning steps are the same as in cycle I, namely planning, implementation, observation, and reflection. Researchers can end the study if the results obtained in cycle II have met the success criteria. If the reflection reveals shortcomings and the success criteria have not been met, improvements will be made in cycle III.

2.3 Data Collection Instruments

The instruments used in this study underwent a validity testing process involving expert lecturers as validators. The validated instruments included observation sheets and reading test instruments to ensure their suitability before being applied in the research. The observation sheet grid for student activities in this study is presented in the following table.

Table 2. Student observation sheet grid

Aspect	Indicator	Item Number	Total
Preparing for Learning	Learning preparation	1	3
	Students listen to the teacher's explanation about today's activities	2	
	Students and teachers sing the song "abc."	3	
Presenting material	Each student was given a set of movable alphabet pieces.	4	4
	Students name the pictures shown by the teacher.	5	
	The teacher takes letters from the board	6	
	Students imitate the sounds of letters pronounced by the teacher.	7	
Providing students with opportunities to try	Students pick 2 letters (consonant and vowel)	8	5
	Students pronounce the two letters by imitating the teacher.	9	
	Students arrange the movable alphabet letters according to the letters on the picture cards.	10	
	Students touch all the letters and write down the shapes of the letters on paper.	11	
	Students look for words that have the same first syllable as the word being studied.	12	
Drawing	Students answer evaluation questions calmly.	13	3
Conclusions	Students listen to the teacher's reflection on today's lesson.	14	
	Students respond to greetings and pray after class	15	
Total			15

On the other hand, test instruments were used to obtain accurate information on the level of students' abilities before and after receiving additional services using the Moveable Alphabet media. These test instruments consisted of pre-tests and post-tests. The tests contained five nouns with a consonant-vowel-consonant-vowel structure. Meanwhile, the test instrument grid in the study was as follows.

Table 3. Reading test instrument guidelines

Question Number	Word Patterns	Recognizing Letters	Sound of Letters	Reading Words
1.	k-v-k-v			
2.	k-v-k-v			
3.	k-v-k-v			
4.	k-v-k-v			
5.	k-v-k-v			

Indicators:
 Recognizing letters: Can name the letters pointed to.
 Letter sounds (phonemes): Can name the initial sound of a particular letter (e.g., b = beh).
 Reading words: Can read open words (k-v pattern) repeatedly (e.g., susu).

2.4 Data Collection Techniques

The data collection techniques used in this study were observation, testing, and documentation. Data analysis was conducted using two approaches, namely qualitative and quantitative data analysis. The qualitative approach in this study was used to describe and interpret the data obtained from observations of student activities during the reading learning process using the moveable alphabet media. Meanwhile, the quantitative approach is used to evaluate students' test results based on the implementation of actions in each cycle. The purpose of this data analysis is to determine the extent to which there has been an improvement in learning outcomes in line with the established objectives. The following description explains each type of data analyzed in this study.

a. Test Results

This test contains 5 nouns with a consonant-vowel-consonant-vowel structure, with a repeating consonant-vowel pattern. Thus, if students can read consonant-vowel syllables, they will automatically be able to read words that are repetitions of the same syllables. Students are considered to have passed each question if they meet the three indicators of early reading: recognizing letters, recognizing letter sounds (phonemes), and reading syllables. Data analysis of reading ability uses quantitative techniques. The formula used to measure test results is as follows.

a) Completion Rate of Each Student

$$PS = \frac{\text{Student Scores}}{\text{Total Score}} \times 100\%$$

Note:

PS: Percentage of students

b) Average of all students

$$CA = \frac{\sum \text{Total score of all students}}{\sum \text{All Students}} \times 100\%$$

Note:

CA: Class Average

b. Observation Results

In this study, data from observations of the implementation of the learning process were analyzed using a qualitative descriptive approach. This approach was used to evaluate the activities of teachers and students during learning. Furthermore, the observation data were classified based on the assessment criteria presented in the following table.

Table 4. Observation Assessment Categories

No	Percentage of Mastery (%)	Category/Ranking
1.	86-100	Very High
2.	76-85	High
3.	60-75	Moderate
4.	55-59	Less
5.	≤54	Not Enough

Data triangulation was conducted through tests, observations, and documentation to enhance the validity of the findings. Quantitative data from pre- and post-tests showed measurable improvement in early reading skills, while qualitative data from observations and documentation explained students' behaviors and learning engagement. Both types of data were integrated to provide a comprehensive understanding of the effectiveness of the RTI-based moveable alphabet intervention.

3. FINDINGS AND DISCUSSION

3.1 Findings

Student reading ability data was obtained using observation sheets, tests, and documentation. Before conducting the research, the researcher conducted a pretest to obtain pre-action data. This action was carried out in two cycles, with each cycle consisting of four meetings. Cycle I, in session 1, focused on the letters a, m, and d; session 2 on the letters i, b, and g; session 3 on the letters e, l, u, and s; and session 4 on the letters a, d, and p. The core competencies developed in Cycles I and II were the same, but the presentation of the material differed based on reflections from Cycle I. The sequence of activities in each cycle of this action research consists of planning, implementation, observation, and reflection. Research data was obtained through tests conducted at the end of each cycle. The results of this research can be summarized as follows.

3.1.1 Pre-Cycle Results

To determine the initial reading ability of the students, the researcher conducted a pretest on April 15, 2025, at 11:00 a.m. after the other students had left school, using five words with a repeated k-v-k-v pattern. The following are the results of the pretest of the initial reading ability of first-grade students with reading difficulties.

Table 5. Recapitulation of pretest scores for early reading skills

No	Initials	Score (%)	Description
1	RS	60	FAILED
2	MG	40	FAILED
3	MF	40	FAILED
4	FNI	20	FAILED
5	KYP	40	FAILED
6	MSAF	40	FAILED
7	IK	0	FAILED
8	NZP	0	FAILED

Based on this data, the average score in the pre-cycle was 30%, with the highest score obtained by subject RS with a score of 60% and the lowest score obtained by subjects IK and NZP with a score of 0%, meaning that the students were unable to read any words.

3.1.2 Results of Cycle I

Cycle I consists of several stages, including: action planning, action implementation (meeting 1, meeting 2, meeting 3, and meeting 4), observation, and reflection. In Meetings 1 and 2, some students only showed enthusiasm in using the media, wanting to hold and arrange letters by watching their peers do so, without any independence, and still seemed to be "just playing." However, this is a good start to motivate students in reading practice. In Meetings 3 and 4, students began to try on their own and were more active in asking questions when they did not understand. Overall, students were actively participating in the learning process, and the classroom environment was conducive. The reflection results filled out by the students also yielded very good outcomes. The post-test results obtained by the students in Cycle I can be presented as follows.

Table 6. Recapitulation of Cycle I post-test results

No	Initial	Score (%)	Description
1	RS	80	PASSED
2	MG	60	FAILED
3	MF	80	PASSED
4	FNI	60	FAILED
5	KYP	80	PASSED
6	MSAF	80	PASSED
7	IK	40	FAILED

Based on the data, it can be seen that only 4 students achieved the success criteria of 80%. After the intervention in cycle I, 8 subjects experienced a significant improvement. The average score increased from 30% in the pre-cycle to 67.5% in cycle I. Subject NZP, who initially scored 0% in the pre-cycle, improved to 60% in cycle I.

The results of the research in cycle I and during the evaluation revealed several strengths and weaknesses. Learning in cycle I improved compared to the pre-cycle. This is evident from the fact that initially, no students passed the reading test, but in cycle I, 4 students (half of the subjects) passed. However, there are several areas that need improvement to enhance the quality of learning and students' reading skills using the moveable alphabet medium. This reflection serves as the basis for taking action in the next cycle. The results of the reflection in Cycle I can be detailed as follows.

- 1) Only 4 students passed in cycle I. This shows that only 50% of students met the criteria for success.
- 2) There was a lack of communication with all subject teachers, so that there were no more subjects to be returned when the action was to be implemented.
- 3) The duration of each meeting was too short. Some meetings in Cycle I were not optimal because students had to rush home on the school bus.
- 4) Some students did not attend several meetings due to transportation constraints. This resulted in gaps in attendance, with students missing that day's material and forgetting previously learned material.
- 5) Many students peeking from outside the room disrupted the subject's focus during the study.

3.1.3 Results of Cycle II

Cycle I consists of several stages, including: action planning, action implementation (meeting 1, meeting 2, meeting 3, and meeting 4), observation, and reflection. Observations or reflections on the students also showed satisfactory results. The students were very enthusiastic in participating in learning using the moveable alphabet media. This can be proven by the observation sheets filled out by the students. Even when there were no meetings, students requested to learn again. Student independence also increased. The researcher ensured that students could arrange the letters on their own. Overall, students were actively participating in the learning process, and the classroom environment was conducive. The post-test results obtained by students in Cycle II can be presented as follows.

Table 7. Recapitulation of Cycle II post-test results

No	Initial	Score (%)	Description
1	RS	100	PASSED
2	MG	80	PASSED
3	MF	100	PASSED
4	FNI	100	PASSED
5	KYP	100	PASSED
6	MSAF	100	PASSED
7	IK	80	PASSED

Based on the data, it can be seen that all students passed, meaning they answered 80% of all questions correctly. The average score increased to 92.5% from 67.5% in cycle I. Four students achieved a perfect score of 100%. The reading speed of some students also improved. Overall, the learning process in cycle II was good. This is because cycle II was an improvement on cycle I, so that implementation could be more optimal in terms of learning, student readiness, and external factors such as student transportation. Students who were unable to attend were still able to participate because the media could be taken home and they could study at home. In cycle II, all students successfully met the completion criteria. Therefore, the study was terminated and not continued into Cycle III. The following is a diagram of the progress results before the cycle, cycle I, and cycle II.

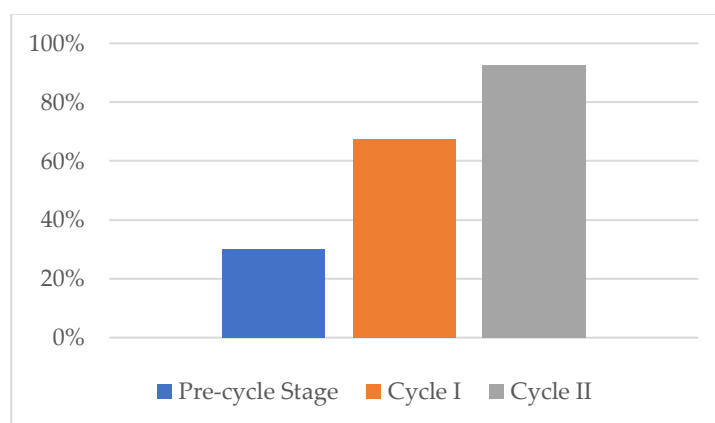


Figure 1. Progress results before the cycle, cycle I, and cycle II

The improvement in reading ability among all students in this study is the result of using the RTI-based moveable alphabet media, where students with reading difficulties were given the opportunity to learn in smaller groups outside of class hours. Attendance and attrition posed challenges, especially in Cycle I, when some students missed sessions due to transportation constraints and limited lesson time. To address this, the researcher coordinated with parents, allowed students to practice with the

moveable alphabet at home, and adjusted schedules to ensure continuity. In Cycle II, extended learning time and flexible arrangements minimized absences, resulting in stable attendance and more effective implementation of the intervention.

Qualitative data, including student comments and engagement during lessons, were analyzed using descriptive qualitative analysis. Observation notes were organized into categories such as enthusiasm, focus, independence, and participation, allowing patterns of behavior to be identified. These categories were then used to explain and complement the quantitative test results. Thus, it can be concluded that the use of RTI-based moveable alphabet media is effective in improving early reading ability for children with reading difficulties.

3.2 Discussion

The purpose of this study was to improve the early reading skills of first-grade students experiencing learning difficulties at Anugerah Abadi 2 Bengalon Elementary School through the use of moveable alphabet media based on the Response to Intervention (RTI) approach. The focus of the study was on how tiered intervention and the use of multisensory media could help students recognize letters, combine syllables, and read simple words more effectively.

Based on the analysis of data obtained from the pre-cycle, Cycle I, and Cycle II, there was an improvement in early reading skills among all students. The most significant improvement occurred in Cycle I, when the intervention was first implemented using the moveable alphabet media. This surge indicates that concrete media can have a direct impact on early literacy skills, particularly among students with reading difficulties. The constructivist learning theory pioneered by Piaget (1972) asserts that effective learning occurs when students actively construct their knowledge through direct interaction with their environment (Nuraini, 2024; Wati et al., 2023). In this context, the moveable alphabet provides a means for students to physically manipulate letters while associating them with sounds, thereby reinforcing the process of internalizing concepts of letters and phonemes. This finding is consistent with the view that direct interaction with learning objects facilitates the formation of new cognitive schemas that are more robust and meaningful (Alfadhilah, 2025).

This success also reinforces the experts' opinion that concrete media are more effective than abstract media because they stimulate multisensory engagement, including visual, auditory, and kinesthetic aspects (Faruq & Pratisti, 2022; Wijaya et al., 2021). In Montessori education, the movable alphabet is designed not only to introduce letters, but also to build a deep connection between written symbols and the sounds of language. Montessori emphasizes that children learn best when they can hold, move, and arrange letters, because physical involvement helps to embed abstract concepts into real experiences (Aisya et al., 2022). This theory is also supported by other studies that found that a multisensory approach to reading instruction can improve long-term memory retention and strengthen phonetic skills, especially in young children.

In addition to the appropriate use of media, this study also applied Level 2 Response to Intervention (RTI) as a learning strategy framework. Level 2 RTI is a structured intervention provided to students who show below-standard progress, with a higher intensity than core learning (Fuchs & Fuch, 2006). In this study, teachers not only applied moveable alphabet-based learning activities, but also conducted formative assessments and progress monitoring consistently at the end of each cycle. This continuous evaluation process provided accurate data for teachers to adjust their strategies, so that the interventions provided were more personalized, relevant, and targeted. This model combines the individualistic pedagogical principles of Montessori with an evidence-based practice approach in RTI.

The consistency of evaluation at each meeting proved to be one of the key factors in its success. The effectiveness of RTI is greatly influenced by the frequency of progress monitoring and the flexibility of teachers in redesigning interventions according to student needs (Vaughn & Wanzek, 2014). With continuous feedback from assessment results, teachers can identify specific obstacles experienced by students, such as difficulties in connecting sounds and letters or inability to maintain focus, and immediately adjust their teaching approach. From a Montessori perspective, this step is in line with the

principle of following the child, which is to adjust learning to the rhythm and interests of each child, so that the learning process becomes more natural and effective.

The positive impact is not only seen in the improvement of early reading skills but also in the aspect of student motivation. Observation results show that after the intervention, students appear happier, more enthusiastic, active, and do not show signs of fear or stress when learning to read. Students reported that the use of the movable alphabet made the learning process feel easier and more enjoyable. According to Self-Determination Theory, active engagement combined with enjoyment in learning strengthens intrinsic motivation, which ultimately drives academic success (Ryan & Deci, 2020). In this context, the moveable alphabet not only functions as a learning medium, but also as a trigger for positive emotional engagement.

An interesting phenomenon emerged after all learning activities were completed. Some students voluntarily requested to use the moveable alphabet again on subsequent days, even though the formal intervention sessions had ended. This indicates that the medium successfully fostered sustained learning interest. Interest developed through positive learning experiences can evolve into deep-seated individual interest, which persists over time and encourages active student engagement in independent learning activities (Ginting, 2021; Gray & Diloreto, 2016; Song, 2024). In this study, the moveable alphabet served not only as a learning aid but also as a means of forming positive learning habits.

The results of cycle II showed that all students had achieved a minimum score of 80% of the total score for early reading ability. This criterion became an indicator of the success of the study, so there was no need to conduct cycle III. These results indicate that the intervention was effective across all students, including those with learning difficulties. Several studies also support this finding, stating that the multisensory phonetic approach has been proven to accelerate the mastery of early reading in children with learning difficulties, as this approach optimizes the simultaneous functioning of visual, auditory, and motor memory (Gustiani et al., 2022; Hilmawati et al., 2024; Nurhayati et al., 2020).

This study has several limitations that should be acknowledged. First, the sample size was relatively small (eight students), which restricts the statistical power of the findings. Second, the absence of a control group means that improvements in reading skills cannot be compared directly with students who did not receive the intervention, limiting causal claims. Third, the study was conducted in a single school setting, which reduces the generalizability of the results to broader populations. Finally, the short duration of the intervention may not fully capture the long-term effects of RTI-based moveable alphabet use on reading development. These limitations suggest that while the findings are promising, further research with larger samples, control groups, and diverse contexts is needed to strengthen the evidence base.

The findings of this study provide several practical implications for schools and teacher training programs. First, schools can integrate RTI-based interventions into their literacy instruction to ensure that students with early reading difficulties receive timely and structured support before become more severe (Gillon et al., 2023; Pettit, 2023; Polirstok & Hogan, 2024; Stocker et al., 2024). Second, the use of multisensory media such as the moveable alphabet can be promoted as an effective tool in early literacy classrooms, as it actively engages students' visual, auditory, and kinesthetic senses (Hazaymeh & Khasawneh, 2025; Volpe & Gori, 2019; Zairin & Nordin, 2023). Third, teacher training programs should equip teachers with skills in both RTI implementation and the use of manipulative learning media, enabling them to design tiered interventions, monitor student progress, and adjust instruction based on individual needs (Munna & Kalam, 2021; Uzorka et al., 2024). Finally, collaboration between teachers and parents should be encouraged so that learning interventions can be reinforced at home, thereby strengthening students' reading development in a consistent and supportive environment.

This study critically reflects on how integrating RTI with multisensory media, such as the movable alphabet, can address early reading difficulties in a grounded yet scalable way. Rooted in constructivist and multisensory learning theories, the findings show that tiered, hands-on interventions improved decoding skills, word recognition, and student motivation. While the small sample size and absence of a control group limit generalizability, the approach demonstrates strong potential for

replication in inclusive classrooms and teacher training programs. By combining systematic assessment, individualized support, and concrete learning tools, this model provides both a theoretically sound and practically adaptable strategy for strengthening early literacy instruction.

4. CONCLUSION

This study found that integrating moveable alphabet media within the Response to Intervention (RTI) framework significantly enhanced early reading skills among first-grade students with learning difficulties, demonstrating that a multisensory, systematically monitored approach can yield measurable literacy gains while increasing student motivation. The research contributes a practical, low-cost, and scalable instructional model that effectively connects theoretical principles of early literacy intervention with classroom practice. However, the study was limited by its relatively small and potentially homogeneous sample, which may restrict the generalizability of the findings across broader educational contexts. Future research should therefore conduct larger-scale studies with more diverse populations to validate the intervention's effectiveness, as well as investigate digital adaptations of the moveable alphabet to expand accessibility, particularly in multilingual and resource-constrained settings.

REFERENCES

- Abou-Rjaily, K., & Stoddard, S. (2017). Response to Intervention (RTI) for Students Presenting with Behavioral Difficulties: Culturally Responsive Guiding Questions Response to Intervention (RTI) RTI and Challenging Behavior RTI and Cultural and Linguistic Diversity Culturally Relevant Question. *International Journal of Multicultural Education*, 19(3), 85–102. <https://files.eric.ed.gov/fulltext/EJ1159896.pdf>
- Afandi, M. (2014). Pentingnya Penelitian Tindakan Kelas Bagi Guru Dalam Pembelajaran Di Sekolah Dasar. *Jurnal Ilmiah Pendidikan Dasar*, 1(1), 1. <https://doi.org/10.30659/pendas.1.1.1-19>
- Afriatama, R., & Sapri, S. (2023). Menggali potensi gemar membaca melalui program literasi: studi implementasi karakter gemar membaca di masyarakat. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, 9(1), 374. <https://doi.org/10.29210/1202323057>
- Aisya, A. R., Widia Winata, & Happy Indira Dewi. (2022). Fenomena Implementasi Montessori Sebagai Media Pembelajaran Kreatif Untuk Anak Pra Sekolah. *Jurnal Instruksional*, 3(2), 97–116.
- Alfadhilah, J. (2025). Filsafat Pendidikan Anak Usia Dini Menurut Jean Piaget. *Jurnal Pendidikan Islam Anak Usia Dini*, 05(01), 94–111.
- Annela, A., & Safran, S. (2023). Analysis of Early Reading Difficulties for Elementary School Students. *Scaffolding: Jurnal Pendidikan Islam Dan Multikulturalisme*, 5(2), 466–484. <https://doi.org/10.37680/scaffolding.v5i2.3121>
- Birsh, J. R., & Carreker, C. (2018). *Multisensory teaching of basic language skill (4th ed.)*. Paul H. Brookes Publishing.
- Borzekowski, D. L. G., Lando, A. L., Olsen, S. H., & Giffen, L. (2019). The Impact of an Educational Media Intervention to Support Children's Early Learning in Rwanda. *International Journal of Early Childhood*, 51(1), 109–126. <https://doi.org/10.1007/s13158-019-00237-4>
- Cholifah, N., & Sutarna, S. (2024). Learning Difficulties in Beginning Reading for Elementary School Students. *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, 721–727. <https://doi.org/10.23917/iseth.4023>
- Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading*, 9(2), 167–188. https://doi.org/10.1207/s1532799xssr0902_4
- Faruq, F., & Pratisti, W. D. (2022). Model Pembelajaran Multisensori bagi Anak Disleksia, Efektif?: Tinjauan Sistematis. *Ideguru: Jurnal Karya Ilmiah Guru*, 7(3), 243–248. <https://doi.org/10.51169/ideguru.v7i3.392>
- Fuchs, D., & Fuch, L. S. (2006). Introduction to response to intervention: What, why, and how valid is

- it? *Reading Research Quarterly*, 41(1), 93–99. <https://doi.org/10.1598/rrq.41.1.4>
- Gedik, O., & Akyol, H. (2022). Reading Difficulty and Development of Fluent Reading Skills: An Action Research. *International Journal of Progressive Education*, 18(1), 22–41. <https://doi.org/10.29329/ijpe.2022.426.2>
- Gillon, G., McNeill, B., Scott, A., Arrow, A., Gath, M., & Macfarlane, A. (2023). A better start literacy approach: effectiveness of Tier 1 and Tier 2 support within a response to teaching framework. In *Reading and Writing* (Vol. 36, Issue 3). Springer Netherlands. <https://doi.org/10.1007/s11145-022-10303-4>
- Ginting, D. (2021). Student Engagement and Factors Affecting Active Learning in English Language Teaching. *VELES Voices of English Language Education Society*, 5(2), 215–228. <https://doi.org/10.29408/veles.v5i2.3968>
- Gray, J. A., & Diloreto, M. (2016). The Effects of Student Engagement, Student Satisfaction, and Perceived Learning in Online Learning Environments. *International Journal of Educational Leadership Preparation*, 11(1), 1532. <https://www.researchgate.net/publication/310672442>
- Gustiani, N., Asmiati, N., & Pratama, T. Y. (2022). Penggunaan Metode Multisensori Dalam Meningkatkan Kemampuan Membaca Permulaan Anak Berkesulitan Belajar Membaca Di Sekolah Dasar. *Jurnal Holistika*, 6(1), 49. <https://doi.org/10.24853/holistika.6.1.49-56>
- Hasibuan, R. (2024). Penggunaan Media Kartu Huruf untuk Meningkatkan Kemampuan Membaca Permulaan Bagi Siswa Kelas 1 Sekolah Dasar. *Jurnal Basicedu*, 8(1), 373–384. <https://doi.org/10.31004/basicedu.v8i1.7169>
- Hazaymeh, W. A., & Khasawneh, M. A. S. (2025). Exploring the Efficacy of Multisensory Techniques in Enhancing Reading Fluency for Dyslexic English Language Learners. *World Journal of English Language*, 15(1), 146–159. <https://doi.org/10.5430/wjel.v15n1p146>
- Hilmawati, Effendi, D., & Padilah. (2024). The Effect Of The Multisensory Method On The Beginning Reading Ability Of Children In Group B Kb Thia Ananda Mariana. *Journal on Education*, 06(02), 11695–11705.
- Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness: literature review. *International Journal of Humanities and Innovation (IJHI)*, 4(1), 1–4. <https://doi.org/10.33750/ijhi.v4i1.102>
- Nazarnia, M., Zarei, F., & Roozbahani, N. (2023). A mobile-based educational intervention on media health literacy: A quasi-experimental study. *Health Promotion Perspectives*, 13(3), 227–236. <https://doi.org/10.34172/hpp.2023.28>
- Nuraini, G. Y. N. (2024). Membuat Pembelajaran Menyenangkan Berbasis Teori Piaget Untuk Membangun Perkembangan Kognitif Anak Usia Dini. In *Annual Conference on Islamic Early Childhood Education (ACIECE)*, 8(November), Vol. 8, pp. 53–59.
- Nurhayati, H., Handayani, L., & Widiarti, N. (2020). Strategi Pembelajaran Multisensori dalam Mengatasi Kesulitan Belajar Siswa pada Sekolah Dasar. *Jurnal Basicedu*, 5(5), 3(2), 524–532. <https://journal.uin.ac.id/ajie/article/view/971>
- Octaviani, A., Ananda, Y., Krisdiana, M., & Dian, A. (2025). Peran Guru terhadap Kemandirian Anak Kesulitan Belajar. *Murhum*, 6(1), 1320–1334. <https://doi.org/10.37985/murhum.v6i1.1064>
- Oralbayeva, N., Telisheva, Z., Amir, A., Zhanatkyzy, A., Aimysheva, A., & Sandygulova, A. (2024). Moveable Älpbi: Design of Montessori-Based Child-Robot Interaction for Long-Term Alphabet Learning. *International Journal of Social Robotics*, 691–695. <https://doi.org/10.1007/s12369-024-01189-z>
- Pattiwael, E., Wiraswati, A. A. K. S., Utami, I. G. A. A. Y., & Fauzi, A. (2024). Efektivitas Penerapan Metode Montessori Dalam Meningkatkan Kemampuan Literasi Awal Kelompok B Di Tk Bahtera Bukit Zaitun. *Manasa*, 13(2), 38–55. <https://doi.org/10.25170/manasa.v13i2.6081>
- Pettit, R. L. (2023). *Exploring the Influence of Pbis, Rti, and Mtss Implementation on Classroom Time, Student Behavior, and Academic Achievement: a Phenomenological Study*. Liberty University, Lynchburg, VA.
- Polirstok, S., & Hogan, J. (2024). Implementation of Rtl as a Part of Multi-tiered Systems of Support:

- What Teachers, Administrators, Teacher Educators Need to Know. *Excelsior: Leadership in Teaching and Learning*, 16(2), 5–21. <https://doi.org/10.14305/jn.19440413.2023.16.2.05>
- Rahma, R., Andayani, & Anindiyarini, A. (2024). Teaching reading in digital era: Exploring Indonesian in-service teachers' perceptions and challenges. *Contemporary Educational Technology*, 16(4). <https://doi.org/10.30935/cedtech/15159>
- Rahmawati, R. A., Susiani, T. S., & Suryandar, K. C. (2025). Penerapan Metode Montessori dengan Media Moveable Alphabet untuk Meningkatkan Keterampilan Membaca dan Menulis Permulaan pada Siswa Kelas I Sekolah Dasar. *Kalam Cendekia*, 13(2), 909–917.
- Ryan, R. M., & Deci, E. L. (2020). Self-determination theory. *Routledge Handbook of Adapted Physical Education*, 55(1), 296–312. <https://doi.org/10.4324/9780429052675-23>
- Sari, Y. E., Dewi, M. S., & Anggraheni, I. (2024). Penggunaan Media Large Moveable Alphabet Dalam Pengenalan Keaksaraan Awal (Studi Kasus Di Kelompok B Ra Syihabuddin Landungsari Dau Malang). *Dewantara: Jurnal Ilmiah Pendidikan Islam Anak Usia Dini*, VI(1), 2. <http://riset.unisma.ac.id/index.php/fai/index>
- Setiyadi, R., Damaianti, V. S., Hernawan, A. H., & Agustin, M. (2025). Objective Conditions of Indonesian Language Learning in Improving Reading Comprehension and Writing Skills in Elementary Schools. *KnE Social Sciences*, 10(12), 350–358. <https://doi.org/10.18502/kss.v10i12.18924>
- Share, D. L. (1995). Phonological recoding and self-teaching: sine qua non of reading acquisition. *Cognition*, 55(2), 151–218. [https://doi.org/10.1016/0010-0277\(94\)00645-2](https://doi.org/10.1016/0010-0277(94)00645-2)
- Song, Y. (2024). Assessing the interactions between learning enjoyment, motivation, burnout, and grit in EFL students: a mixed-methods approach. *BMC Psychology*, 12(1). <https://doi.org/10.1186/s40359-024-02303-6>
- Stocker, K. L., Fox, R. A., Swain, N. R., & Leif, E. S. (2024). Between the Lines: Integrating the Science of Reading and the Science of Behavior to Improve Reading Outcomes for Australian Children. *Behavior and Social Issues*, 33(1), 504–531. <https://doi.org/10.1007/s42822-023-00149-y>
- Tantri, A. A. S. (2016). Hubungan antara Kebiasaan Membaca dan Penguasaan Kosakata dengan Kemampuan Membaca Pemahaman. *Acarya Pustaka*, 2(1), 1–29.
- Uzorka, A., Kalabuki, K., & Odebiyi, O. A. (2024). The effectiveness of in-service teacher training programs in enhancing teaching quality and student achievement. *Forum for Education Studies*, 2(3), 1465. <https://doi.org/10.59400/fes.v2i3.1465>
- Vaughn, S., & Wanzek, J. (2014). Intensive intervention in reading for students with reading disabilities: Meaningful impacts. *Learning Disabilities Research & Practice*, 29(1), 46–53. <https://jurnal.stitnualhikmah.ac.id/index.php/modeling/article/view/43>
- Volpe, G., & Gori, M. (2019). Multisensory interactive technologies for primary education: From science to technology. *Frontiers in Psychology*, 10(JUN). <https://doi.org/10.3389/fpsyg.2019.01076>
- Wati, S. O., Zaim, M., & Thahar, H. E. (2023). Aplikasi Teori Konstruktivisme dalam Konteks Pengajaran Bahasa Asing. *Journal of Education Research*, 4(4), 2480–2485. <https://doi.org/10.37985/jer.v4i4.767>
- Wijaya, R., Vioreza, N., & Marpaung, J. B. (2021). Penggunaan Media Konkret dalam Meningkatkan Minat Belajar Matematika. *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara III*, 579–587.
- Zairin, S., & Nordin, M. N. (2023). the Effectiveness of a Multisensory Approach in Improving Open Syllabic Reading Skills of Special Education Needs Students (Sens). *Special Education [SE]*, 1(1), e0008. <https://doi.org/10.59055/se.v1i1.8>
- Zhang, J., Martella, R. C., Kang, S., & Yenioglu, B. Y. (2023). Response to intervention (rti)/multi-tiered systems of support (mtss): a nationwide analysis. *Journal of Educational Leadership and Policy Studies*, 7(2), 302.