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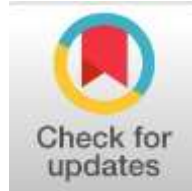
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Android Based Learning Media Application For Early Reading Among Intellectually Disabled Students: Aplikasi Media Pembelajaran Berbasis Android Untuk Membaca Permulaan Siswa Tunagrahita

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Abstract

General Background Inclusive education mandates equitable academic access and adaptive instructional strategies for students with diverse cognitive characteristics. **Specific Background** First-grade learners with intellectual disabilities at SDN 001 Sangatta Utara struggle with phoneme recognition and syllable decoding due to conventional, text-heavy instructional materials. **Knowledge Gap** Previous literature confirms the utility of digital tools, yet empirical classroom action research specifically evaluating interactive Android applications for foundational literacy among intellectually disabled elementary cohorts remains limited. **Aims** This study investigates the application of multisensory Android-based learning media to support letter identification, syllable decoding, and classroom participation. **Results** Through a two-cycle intervention integrating visual and auditory digital stimuli with the Global Method, the student's early reading proficiency scores progressed from a 37.50% baseline to 76.25%. Concurrently, observation metrics indicated a substantial rise in classroom engagement, reaching 86.36% due to the concrete and repetitive nature of the interactive application. **Novelty** This research provides directempiricalevidence demonstrating how customized mobile learning platforms mitigate specific cognitive barriers in early literacy acquisition for intellectually delayed learners. **Implications** Elementary educators must transition toward multisensory digital pedagogical tools to foster equitable and engaging literacy environments, requiring institutional backing for technological integration in special education.

Highlights

- ♦ Integrating Android learning applications significantly elevates phoneme recognition and syllable decoding proficiencies.
- ♦ Multisensory digital stimuli successfully sustain classroom attention and active instructional engagement.
- ♦ Iterative pedagogical adjustments combining mobile media and the Global Method optimize fundamental literacy.

Keywords

Early Reading Skills; Android Learning Media; Intellectual Disabilities; Classroom Action Research; Inclusive Education

INTRODUCTION

Education provides equal opportunities for all members of society, including students with disabilities, to develop their potential and participate fully in learning. Inclusive and special education play a strategic role in ensuring that every learner receives equitable access to quality education according to their individual characteristics and needs. This commitment is affirmed in Indonesia through Law Number 20 of 2003 on National Education System which states that students with physical, emotional, mental, intellectual or social disabilities have the right to special educational services that are tailored to their specific learning needs. Therefore, educational practices should not only guarantee access to school but also provide appropriate learning strategies to allow each student reach the best development. The mastery of early reading skills is one of the basic competencies to be achieved by students in elementary education. Early reading is the foundation of literacy development as it allows students to gather information, comprehend learning materials and be able to participate effectively in subsequent educational activities. This competency involves recognition of letter symbols, association of letters with corresponding sounds, decoding of syllables and reading of simple words. Therefore, the development of early reading skills is a necessary prerequisite for academic achievement in all areas of learning.

But developing early reading skills is still a big challenge for students with intellectual disabilities. Students with these conditions usually have deficits in intellectual functioning and adaptive behavior that affect working memory, attention span, abstract reasoning, and information processing. The limitations mean that reading skill acquisition is significantly slower than for typically developing students and requires instructional approaches that are adaptive, systematic, repetitive and matched to their cognitive characteristics. Alnahdi (2015) stated that the development of early reading and writing skills among students with intellectual disabilities is slower and thus needs instructional methods that take into account their learning characteristics through diversified and appropriate instructional strategies.

This condition also occurred in first-grade students with intellectual disabilities in SDN 001 Sangatta Utara. Initial classroom observations revealed that these students had difficulty in identifying letter shapes, linking letters to their sounds, and reading simple syllables and everyday words. They also showed low self-esteem, low motivation to learn, and short attention spans in the classroom activities. In addition, the challenges were exacerbated by the fact that conventional learning media used in the classroom were printed reading exercise books, which offered limited opportunities for engaging, concrete and multisensory learning experiences that were appropriate to the characteristics of students with intellectual disabilities. The use of instructional media can facilitate effective learning by providing information in formats that fit the students' learning characteristics. According to Rusli et al. (n.d.), instructional media can help to improve the effectiveness of learning by providing clarification of learning materials, increasing students' attention, and supporting meaningful learning experiences. According to Arifudin et al. (2024), digital instructional materials can improve the quality of learning, student motivation, and conceptual understanding through interactive and engaging learning experiences. These results indicate that digital learning media can be used as an effective alternative instruction, especially for students with special education needs.

The rapid development of technology also encouraged the integration of Android-based mobile learning media into the education setting. Applications on the Android platform provide more engaging learning environments than traditional instructional media by incorporating text, images, audio, animations, and immediate feedback to create interactive learning experiences. Android-based applications are effective in improving early reading instruction, because they increase students' motivation and help in gradual learning of the letter recognition and word-reading skills (Febriani et al., 2018). The characteristics of android-based instructional media are also in accordance with the principles of Universal Design for Learning (UDL), which encourage multiple means of representation, engagement, and expression to meet the diversity of students. Android-based applications create an inclusive learning environment for students with disabilities by combining visual, auditory and interactive elements. In their previous studies, Eka et al. (n.d.) and Yuwono et al. (2024) reported that interactive Android applications greatly increase student participation, learning flexibility, and classroom engagement among students with special educational needs.

However, while previous studies have consistently shown that digital learning media are effective in improving learning outcomes of students with disabilities, there are still some research gaps. Eka and Mayangsari (2023) conducted an experiment to determine the effect of Android-based media in learning Indonesian language on the early reading skills of students with intellectual disabilities in special schools. Dewi et al. (2026) in Classroom Action Research reported that interactive PowerPoint media was effective to enhance reading skills of syllables for students with intellectual disability. Digital Big Book media has been demonstrated to increase letter and word recognition in students with intellectual disabilities (Aprillia et al., n.d.). Similarly, Sugiarti and Rahmatrisilvia (2026) also found that the Marbel educational application is effective to improve early reading skills by increasing student engagement in learning. Also, Aini and Mahmudah (n.d.) found that the Marbel Game application significantly improved the learning outcome of students with mild intellectual disability, even though the study was not specifically about early reading skills.

However, the research that has been conducted so far has focused on the effectiveness of various types of digital media such as interactive PowerPoint, digital Big Books, and educational applications, but not on Android-based instructional media specifically developed to improve early reading skills among first-grade students with intellectual disabilities in real classroom settings. Furthermore, most of the previous studies were experimental so they did not inform the process of continuous instructional improvement through Classroom Action Research. Therefore, empirical evidence of the implementation of Android-based learning media that is specifically designed for teaching early reading to students with intellectual disabilities at the elementary school level is still limited. Therefore, this research aims to describe the process of learning and the result of improving the early reading skills of first-grade students with intellectual disabilities through the

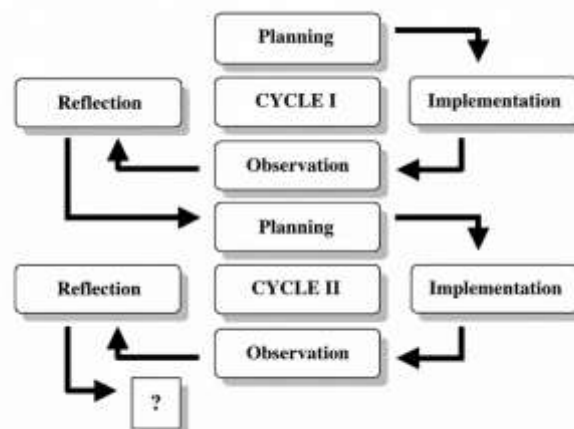
use of Android-based learning media at SDN 001 Sangatta Utara. The results are expected to contribute theoretically to the development of special education research, particularly in the integration of digital learning media in early reading instruction for students with intellectual disabilities. In practice, the results are expected to provide teachers with an innovative instructional alternative to design more interactive, adaptive, and student centered learning experiences that will successfully improve early reading skills among students with intellectual disabilities.

METHOD

This research employs Classroom Action Research (CAR) with a quantitative approach in improving early reading skills of the first-grade of intellectual disability by utilizing android-based learning media. Classroom Action Research is known to be an effective way to systematically solve problems in instruction and improve the quality of classroom learning through reflective practice (Ade Rahayu & Arna Saskia, 2025). It helps teachers know the learning difficulties, improve strategies, monitor the impact, and measure the results to improve the quality of instruction (Putri et al., 2023). This approach was therefore considered appropriate, since the main purpose of the study was not only to assess the learning outcomes but also to improve the instructional process by means of the iterative cycles of planning, implementation, observation and reflection.

This study used the model of Classroom Action Research of Kemmis and McTaggart which consists of four interrelated stages; they are planning, action, observation and reflection. In this model, the implementation of instructional actions and classroom observation take place simultaneously, which enables researchers to observe the immediate effects of the intervention during the process of learning. The reflection at the end of each cycle becomes a basis for evaluating the effectiveness of the action taken and whether it needs to be revised further and continued to the next cycle (Arikunto et al., 2021; Ade Rahayu & Arna Saskia, 2025). The research was done in two cycles of action, each cycle consisted of three learning meetings and one post-test to measure the development of early reading skills of students. This intervention is done by introducing vowel phonemes (/a/, /i/, /u/, /e/, and /o/), syllables, and easy words of everyday life through the Qreatif.id Android-based literacy application.

Figure 1. Research Procedure Based on the Kemmis and McTaggart Classroom Action Research Model



The research was conducted in SDN 001 Sangatta Utara in the period of May to June 2026. The subject of this research was 1 student of grade 1 who was diagnosed with intellectual disability based on the results of IQ test and school evaluation records. Data were gathered through classroom observations and early reading achievement tests administered before and after each action cycle. The observation data were qualitatively analyzed to find out the students' participation, attention, motivation, and teacher performance during the instructional process. Meanwhile, the test scores were descriptively analyzed by calculating the percentage to find out the improvement of students' early reading skills. The success of the intervention was measured through changes in the learning process and students' reading performance over several action cycles, as per the premises of Classroom Action Research.

RESULT AND DISCUSSION

Result

An initial classroom observation was carried out before the intervention was implemented to find out the student's learning difficulties during Indonesian language lessons in Grade I at SDN 001 Sangatta Utara. The observation showed that the student with an intellectual disability had problems recognizing and remembering the letter forms, reading simple consonant-vowel (CV-CV) syllables, and combining syllables to form meaningful words even though the student was able to recite the alphabet from a to z. In addition, the early reading teaching mostly employed the traditional learning media, such as reading exercise books and letter cards. Based on this result, the researcher collaborated with one colleague as an observer to design an appropriate classroom action by using Android-based learning media to improve the student's early reading skills.

Early Reading Skills Before the Intervention

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The subject of this research was one of the first grade students who has an intellectual disability in SDN 001 Sangatta Utara. Before the implementation of classroom action, a pre-action assessment was conducted to find out the initial level of the student's early reading ability. The assessment consisted of 20 performance-based items to assess four domains of early reading skills, including letter identification, letter reading, syllable reading, and simple word reading. To facilitate students' responses and ensure consistency in test administration, the assessment tasks were presented with visual and audio support through Android device. The pre-intervention assessment results are shown in Table 1 .

Table 1. *Student's Initial Early Reading Ability Before the Intervention*

Subject	Maximum Score	Pre-Invention Score	Percentage	Category
MA	80	30	37.5%	Poor

As shown in Table 1, the student's early reading ability initially scored 30 out of 80, which is 37.5% and belongs to the poor category. These findings suggest that the student had not yet mastered the fundamental skills of early reading. The early reading ability of the subject MA was classified as poor based on the results of the pre-intervention assessment. The student had some difficulties in the assessed reading components especially in letter recognition, syllable pronunciation and reading simple words. The results suggest that the student's underlying reading skills were still limited and instructional support was needed through an intervention specifically designed to address the learning characteristics of students with intellectual disabilities. The results before the intervention are used as a baseline for the next action cycle to implement android-based learning media to improve the student's early reading ability. Cycle I

The planning stage of Cycle I began by preparing a lesson module on recognizing vowels, reading syllables and reading simple words. The researcher also made learning media based on Android with the Qreatif.id application, supported by tactile letters, magnetic board and letter cards. In addition, observation sheets for teacher and student activities and assessment instruments to measure students' early reading skills after the intervention were developed. The instructional materials were designed to introduce the vowel phonemes /a/, /i/, /u/, /e/, and /o/ combined with reading simple everyday words such as buku (book), baju (shirt), topi (hat), dasi (tie), and meja (table).

The intervention (Cycle I) comprised three instructional sessions and one post-intervention assessment. Each meeting has a duration of 2×35 minutes and the main learning media used is android-based learning media. The learning process was undertaken in three phases, viz. preliminary activities, core activities and closing activities. In the preliminary activities, the teacher prepared the student to learn by apperception, explained the objectives of learning and introduced the Android-based application to be used in the lesson. The teacher introduced the letter in core activities using the visual and audio features of the Qreatif.id application. Then the student had to repeat sounds of the letter (drilling), to trace the letter on the Android screen, to match the letter and syllables using features of an interactive game, and then to read syllables and simple words with which the student was familiar to objects. In order to support the learning, these activities were integrated with concrete instructional media such as tactile letters and magnetic board so that the student could associate the shape of a letter with its sound. In the closing activities the teacher did the reflection, gave the positive reinforcement and evaluated the student's learning through reading tasks with letters, syllables and simple words.

The three instructional meetings in Cycle I showed gradual improvement of the process learning. The first meeting was to introduce the vowel phonemes /a/ and /u/ by giving the words of baju (shirt) and buku (book). In the second meeting the phonemes /i/ and /o/ were introduced with the words dasi (tie) and topi (hat) . During the third session the phoneme /e/ was introduced in the word meja (table). Each meeting the student was involved in a series of structured learning activities such as identifying letter shapes, listening to the sounds of letters generated by the application, tracing letters, matching letters and syllables, and gradually reading simple words with the help of the Qreatif.id application and concrete learning materials. The teacher gave the student individual guidance and ongoing verbal reinforcement throughout the learning process for each successful completion of learning tasks.

During the implementation of Cycle I, classroom observations were conducted to evaluate students' participation. The observation instrument consisted of 11 indicators which were grouped into four aspects, namely attitude, attention, participation and learning interest. Each indicator was scored on a four-point scale with a maximum possible score of 44. The results of observation are shown in Table 2.

Table 2. *Student Participation Observation Results in Cycle I*

Meeting	Maximum Score	Obtained Score	Percentage (%)	Category
I	44	29	65.90	Good
II	44	31	70.45	Good
III	44	32	72.72	Good

Table 2 shows a gradual improvement on the student's classroom participation during Cycle I. The participation score increased from 65.90% in the first meeting to 70.45% in the second meeting, and improved to 72.72% in the third meeting. All three meetings were categorized as good, but the increasing percentages indicate that the Android-based learning media has a positive contribution to student engagement in the instructional process. Attitude: The student demonstrated a positive attitude in the learning activities. The student responded correctly to greetings from the teacher, answered simple questions and participated in opening activities including leading the prayer with teacher guidance. The student was initially shy and spoke in a low voice, however increased confidence was seen as the learning sessions progressed. The student was consistently attentive to the learning activities and responded well to the teacher's directions. The student observed the visual display of the Android application carefully and was able to imitate the audio pronunciation produced by the Qreatif.id application. This degree of attention continued across all three instructional meetings.

The student became more involved in learning activities in terms of participation. The student required verbal and non-verbal guidance when tracing and matching letters, but was more independent when completing interactive games such as matching letters, matching syllables and identifying letters. The teacher gradually reduced direct help and began to give verbal prompts, showing the child's growing independence in learning. The student showed a high level of learning interest towards the Android-based learning activities. Student was responsive to teacher directions including identifying specific letters and matching letters to make words and actively participated in the lesson from the beginning to the end of the lesson and did not leave the classroom during the lesson. The result of this study showed that the learning media based on Android was able to attract and keep the student attention in the process of teaching and learning.

Table 3. *Comparison of Early Reading Skills Before and After Cycle I*

Subject	Pre-Intervention		Cycle I		Improvement
	Score	Percentage	Score	Percentage	
MA	30	37.5%	50	62.5%	25%

As illustrated in Table 3, the student's initial reading score was 30 (37.5%) prior to intervention and increased to 50 (62.5%) after Cycle I, or a 20 point or 25 percentage point improvement. The student's performance had improved from the poor category to the fair category, but the expected level of achievement was not yet met, showing that further instructional enhancement was still needed. Additionally, the post-test results indicated the improvement of several aspects of early reading ability. The student was able to pronounce the phonemes /a/, /b/, /o/, /u/ in isolation. But in identifying and pronouncing the phonemes /i/, /e/, /t/ and /d/ help was still required. To aid the children in recognizing the letters the teacher used visual associations with familiar objects, for example, the letter i as a pencil and the letter t as an umbrella. The student was able to discriminate the letters more accurately during the learning activities with these visual cues.

It was also found to improve reading of syllables and words. The student is able to read simple words that have been introduced in the learning sessions such as buku, baju, topi, dasi, meja. However, reading success was still tied to teacher help in the form of verbal prompts and picture cues. When the printed words were accompanied by pictures, the student showed more independence, suggesting that visual support was still an important component in facilitating reading comprehension. The results showed that the student's early reading ability increased from 37.5% in the pre-intervention assessment to 62.5% after the implementation of Android-based learning media in Cycle I. The findings indicate that the intervention positively impacted the student's early reading development, but more improvement was needed for the student to meet predetermined success criteria.

Reflection was done together by the researcher and the observer to determine the effectiveness of Cycle I and what needed to be improved in the next cycle. The use of learning media based on Android generally has a positive effect on the learning process. The student was more enthusiastic, active in the classroom, and more motivated to use the interactive learning media. The student showed improvement in attitude, participation and early reading skills. The learning outcomes have not reached the predetermined mastery criterion yet. The implementation of Cycle I has proved to be challenging. First, the teacher's attention was split because instructional responsibilities also engaged other students in the classroom. Secondly, the student was distracted easily in concentration when other students entered the learning area. Thirdly, the Android application had many features that resulted to the student sometimes not focusing on the learning activities.

The student made significant progress in early reading skills from the pre-intervention assessment; however the achievement was not at the expected level of mastery. Thus, Cycle II was implemented to overcome the limitations found in the reflection stage. There are several improvements planned: 1) increasing the time for independent letter recognition practice through letter matching and letter identification games with the supervision of a teacher; 2) the addition of storytelling activities followed by letter identification tasks related to the learning material; 3) simplification of the Android application by limiting the number of features used during instruction; 4) integration of the Global Method with Android-based learning media to improve the student's early reading ability.

Cycle II

Cycle II was conducted based on the results of reflection in Cycle I. Based on the discussion of the findings with the observer, the instructional design was improved to optimize the student's early reading development. Improvements such as increasing the duration of independent letter recognition exercises through educational games under teacher supervision, combining short storytelling activities with letter identification and letter identification exercises, simplifying the features of the Android application to reduce distractions, and integrating the Global Method with Android-based learning media in reading instruction. These changes were intended to increase the effectiveness of the learning process and to solve the problems encountered in the previous cycle.

Cycle II included three instructional meetings and one post-intervention assessment. The meetings lasted 2 × 35 minutes each. The instructional procedures generally followed the procedures implemented in Cycle I, but with the planned improvements. The learning activities still use the Qreatif.id application in the form of an application based on Android as the main media in the learning process supported by concrete learning materials and the Global Method to make it easier for students to learn letters, syllables, and simple words. During the learning sessions, they focused on reading familiar words like buku, baju, topi, dasi, meja. First, the teacher showed how to read whole words by the Global Method, and then the application showed how to pronounce the whole word, then the segmentation of syllables, then the identification of letters, then the reconstruction of syllables and the reading of the whole word. The students then worked on the application in pairs, with the teacher giving individual help. They also played interactive educational games, read words on the whiteboard without extra visual cues, and participated in storytelling and letter identification activities to reinforce learning outcomes. These activities were designed to enhance students' letter recognition, syllable decoding and simple word reading

skills while slowly reducing their reliance on visual cues.

When the three instructional meetings were finished, a post-intervention assessment was given to evaluate the student's progress after Cycle II. The assessment consisted of oral and performance-based tasks to evaluate the student's ability to recognize letters, identify phonemes, read syllables, and read simple words independently. The outcome of this assessment was used to evaluate the effectiveness of the improvements made during Cycle II and to determine if the predetermined success indicators had been achieved.

In Cycle II implementation, classroom observations were carried out to evaluate the student's participation during the learning process. The observation instrument was identical to the one used in Cycle I and was composed of 11 indicators classified in four aspects: attitude, attention, participation and learning interest. Each indicator was scored on a scale of 1–4, with a maximum possible score of 44. The results of the observations are presented in Table 4.

Table 4. *Student Participation Observation Results in Cycle II*

Meeting	Maximum Score	Obtained Score	Percentage (%)	Category
I	44	35	79.54	Good
II	44	36	81.81	Good
III	44	38	86.36	Very Good

Table 4 shows that the student's participation continued to improve throughout Cycle II. The score of participation increased from 79.54% (first meeting) to 81.81% (second meeting) and 86.36% (third meeting) which is in very good category. These results indicate that the improvements carried out in Cycle II were successful in increasing the student's engagement and participation in the learning process compared to Cycle I. With regard to attitude, the student was more confident in the classroom activities. The student responded well to greetings from the teacher and answered simple questions with ease and was an active participant in classroom routines. The student still required teacher assistance leading the opening prayer but was able to correctly and with more confidence than the last cycle complete the activity. The student was attentive and kept a consistent level of attention during the instructional sessions. The student was able to pay attention to the teacher's explanation, pay attention to the learning material presented through the Android application, and imitate the audio pronunciation from the application Qreatif.id. The same sustained attention was observed at all three meetings.

Table 4 shows that the student's participation continued to improve during Cycle II. The score of participation increased from 79.54% (first meeting), 81.81% (second meeting) and 86.36% (third meeting) which is in very good category. The results indicate that the improvement which has been implemented in Cycle II succeeded to improve the engagement and participation of the student in the learning process compared to Cycle I. The student had more positive attitude towards the classroom activities. The student responded well to teacher greetings and answered simple questions easily and was an active participant in classroom routines. The student still required assistance from the teacher to lead the opening prayer, but was able to complete the activity accurately and with more confidence than in the last cycle. The student was on-task and maintained a consistent level of attention throughout instructional periods. The student could pay attention to the teacher's explanation, pay attention to the learning material presented through the Android application, and imitate the audio pronunciation from the Qreatif.id application. All three meetings were attended with the same sustained attention.

Table 5. *Comparison of Post-Intervention Results Between Cycle I and Cycle II*

Subject	Cycle I		Cycle II		Improvement (%)
	Score	Percentage (%)	Score	Percentage (%)	
MA	50	62.5	61	76.25	13.75

The application of Cycle II has improved the ability of early reading of students in Table 5. The score increased from 50 (62.5%) in Cycle I to 61 (76.25%) in Cycle II, with an increase of 11 points or 13.75 percentage points. More important, the student's achievement was above the school's minimum mastery criterion (70%), indicating that the instructional intervention was successful in achieving the desired learning outcome. Early reading skill improved in several ways. The student can pronounce the phoneme /o/ in the word *topi* and /u/ on the word *buku* independently without the teacher's assistance in phoneme reading. However, the student still needed verbal prompts when reading the phonemes /a/, /i/, and /e/. The teacher continued to use familiar visual associations such as the letter *i* compared to a matchstick. The picture of an eagle was used to reinforce recognition of the phoneme /e/ to make recognition easier.

Better still was the improvement in the letter identification. The student was able to identify the phonemes /b/ and /u/ in the word *buku* and the phoneme /o/ in *topi* independently. However, the identification of the phonemes /e/ in *meja*, /i/ in *topi* and /a/ in *baju* still needed a verbal prompt. Similarly, several consonants in the words *buku*, *baju*, *topi*, and *dasi* still needed the teacher's verbal and visual help. Syllable and word reading also showed progress. The student could read the syllables *bu-ku*, *ba-ju* and *to-pi* with vocal support, but *da-si* and *me-ja* still required vocal and visual support. With picture cues and no other verbal support from the teacher in word reading, the student was able to read the words *buku*, *baju*, *topi* and *dasi* on his own. The results indicate the student demonstrated greater independence in connecting visual representations with print and reading familiar vocabulary.

The results of post-intervention of Cycle II showed that generally, the integration of Android-based learning media with the Global Method was effective in improving the student's early reading ability. The improvement was reflected in the increase in assessment scores and also in the increase in classroom participation, attention, learning interest and confidence in the

whole instructional process. These results show the achievement of the success indicators set for this research at the end of Cycle II.

Based on the results of the test and observation obtained in Cycle II, it can be concluded that classroom action research has succeeded in achieving its objectives. The student's early reading score improved consistently, from 37.50% at the pre-intervention stage to 62.50% in Cycle I and 76.25% in Cycle II. The student's score exceeded the school's minimum mastery criterion of 70%. Also, the student's classroom participation was significantly increased by 86.36% at the end of Cycle II which indicates that the student was more independent in using the Qreatif.id Android application, paid more attention to learning activities, and had greater interest in early reading. The results show that the Android based learning media has successfully improved the early reading skills of the student with an intellectual disability. Therefore, the success indicators were met and no further action cycle was needed.

Results showed a consistent improvement in the early reading ability of student MA from pre-intervention stage to the end of Cycle II. Table 6 summarizes the performance of the student for all research steps.

Table 6. *Summary of Students' Early Reading Performance Across Research Cycles*

Assessment Aspect	Minimum Mastery Criterion (MMC)	Pre-Intervention (%)	Cycle I (%)	Cycle II (%)
Early Reading Achievement Test	70	37.50	62.50	76.25
Student Participation Observation	70	65.91	72.73	86.36

As Table 6 shows, the student's early reading achievement increased significantly over the course of the study. The acquisition of the achievement test score increased from 37.50% at the pre-intervention stage to 62.50% in Cycle I, an increase of 25 percentage points. After the instructional refinements in Cycle II, the score went up again to 76.25%, adding another 13.75 percentage points. The student's early reading achievement increased by 38.75 percentage points from the first to the last assessment and was above the school's minimum mastery criterion (70%). The results of this study show that the Android based learning intervention was effective in improving the early reading skills of the student.

Classroom observations also revealed a significant increase in student engagement throughout the learning process in addition to improved reading achievement. The observation score increased from 65.91% at the pre-intervention stage to 72.73% at the end of Cycle I and to 86.36% at the end of Cycle II. This improvement was found in four observed aspects, attitude, attention, participation and learning interest, which showed that the Android-based learning media not only improved academic performance but also improved greater engagement and active participation in classroom instruction.

Discussion

The aim of this classroom action research was to improve the early reading skills of a first grade student with intellectual disability at SDN 001 Sangatta Utara using android-based learning media, namely Qreatif.id application. Results indicated that the student's early reading ability steadily increased from the pre-intervention stage through Cycle I and Cycle II. The early reading achievement score increased from 37.50% in the pre-intervention phase to 62.50% in Cycle I and further increased to 76.25% in Cycle II, which exceeded the minimum mastery criterion of the school (70%). Additionally, the student's participation in the classroom also increased, from 65.91% in the pre-intervention stage to 72.73% in Cycle I and 86.36% in Cycle II. The results showed that the learning media based on Android was able to increase the reading performance and also had a positive influence on the attitude, attention, participation and learning interest of the students in the learning process. The improvement observed is due to the characteristics of the Android-based learning media which provided concrete, interactive and multi-sensory learning experiences. Through the Qreatif.id application, the student could observe the letter shapes, listen to the pronunciation of the letter, practice to trace the letter, match the letter with the syllable, and read the simple words repeatedly. These learning activities provided meaningful repetition, while involving multiple sensory modalities simultaneously. These instructional features are particularly appropriate for students with intellectual disabilities, who often require concrete, structured, repetitive, and highly engaging learning experiences. Alnahdi (2015) found that students with intellectual disabilities learn early reading and writing skills at a slower rate than their peers with typical development. Thus, the instructional strategies should be adapted to their cognitive characteristics. The results of this study support this view, showing that Android-based learning media were able to accommodate the student's learning needs and resulted in gradual improvement of early reading skills.

The results also fit with the Cognitive Theory of Multimedia Learning which posits that learning is more effective when information is presented through multiple channels such as text, images, audio and interactive activities. The Android application allowed the student to work with the information visually and auditorily and interact with the learning materials strengthening letter recognition, phoneme awareness, syllable decoding, and simple word reading. The visual illustrations and audio pronunciation helped the student to recognize phonemes and read familiar words such as buku (book), baju (shirt), topi (hat), and dasi (tie) with the help of this instructional approach. These findings are in line with Rusli et al. (n.d.) who stated that instructional media can improve the effectiveness of learning by clarifying learning materials and increasing student engagement. Similarly, Arifudin et al. (2024) also mentioned that digital learning materials can improve the quality of learning, students' motivation, and conceptual understanding by providing more interactive and meaningful learning experiences. The larger improvement seen in Cycle II can also be attributed to the instructional refinements that were implemented after the reflection stage of Cycle I. Based on the identified limitations, the teacher simplified the features of the application, extended the duration of guided practice, integrated the Global Method into reading instruction, and included short storytelling activities followed by letter identification exercises. The changes eliminated unnecessary distractions and allowed the student to concentrate more fully on the basic tasks of reading. In addition, the Global Method presented meaningful whole words before analyzing the constituent syllables and letters, allowing the student to develop reading skills within meaningful contexts. Therefore, at the end of Cycle II, the student demonstrated more autonomy in the identification of letters, decoding of syllables and reading of familiar words.

The present findings are in line with previous studies investigating the effectiveness of digital learning media for students with special educational needs. Febriani et al. (2018) found that Android-based applications effectively improve early reading instruction by increasing students' motivation and reading achievement. Similarly, Eka and Mayangsari (2023) revealed that the use of Android-based Indonesian language learning media significantly improved the early reading skills of students with intellectual disabilities. Dewi et al. (2026), Aprillia et al. (n.d.), and Sugiarti and Rahmatrisilvia (2026) also reported similar findings and concluded that the use of interactive digital media and educational applications effectively improve early reading ability in students with intellectual disabilities. Thus, the findings of the present study add to the existing evidence that digital instructional media are an effective alternative for supporting literacy development for students with special educational needs. In general, this study shows that learning media based on android, especially Qreatif.id application can improve early reading skills for students with intellectual disabilities. The intervention improved the student's reading achievement and improved classroom participation, learning motivation, attention, and confidence during the instructional process. These findings suggest that instructional technology designed to match the learning characteristics of students with intellectual disabilities can significantly enhance the learning process and learning outcomes. Therefore, learning media based on Android can be an effective alternative of teaching for teachers who want to develop early reading skills for students with intellectual disabilities in elementary school.

CONCLUSION

The results of this classroom action research indicate that the use of Qreatif.id android based learning application can improve the early reading skills of first grade student with intellectual disability at SDN 001 North Sangatta. This improvement was achieved through a systematic and progressive instructional process that progressed from letter recognition to decoding of syllables to simple word reading. The use of the application's multisensory features of visual, auditory and kinesthetic stimulation, combined with unlimited practice opportunities, immediate feedback and gamified learning activities, contributed to a marked increase in the student's engagement, motivation and participation in the learning process. This can be seen from the increase in the student's early reading achievement from 37.50% in the pre-intervention stage to 62.50% in Cycle I and 76.25% in Cycle II, with an overall increase of 38.75 percentage points, thus confirming the effectiveness of Android-based learning media in improving early reading skills in students with intellectual disabilities. Some recommendations could be made based on the findings of this study. It is recommended that schools support the use of innovative and adaptive instructional media, specifically Android-based learning applications, for enhancing early reading instruction of students with intellectual disabilities. The results showed that the teachers should use various learning strategies and learning media such as concrete objects, visual materials, and Android-based applications to meet the different learning needs of students and to enhance their motivation, participation, and confidence in reading activities. It is hoped that future researchers can increase the number of subjects, the duration of the intervention, or explore the effectiveness of the Qreatif.id application in other literacy skills such as initial writing and reading comprehension. Further research on inclusive and special education in Indonesia can be enriched by similar studies using different categories of disability and levels of education.

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