



## Initial Needs Analysis Development Of Image Letter Card Media Based Digital Barcode For Elementary School

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Submitted: 2025-01-18

Revised: 2025-01-24

Accepted: 2025-03-17

### ABSTRACT

*This study was motivated by the low level of beginning reading skills of grade I elementary school students. Many students have difficulty recognizing letters, distinguishing similar letters, and stringing syllables, which is caused by limited facilities, lack of parental support, and the use of conventional learning media. This study aims to analyze the initial needs of media development as an effort to improve the reading skills of elementary school students. The method used in the research is descriptive qualitative with research instruments in the form of observation, questionnaires, and interviews. Data analysis techniques used include data reduction, data presentation, and conclusion drawing. Based on the results of data analysis of the initial needs instrument, it is known that students' reading skills are still low with a percentage of 40%. Difficulties in beginning reading include some students not recognizing letters, students cannot distinguish letters that are almost the same shape, students cannot string syllables, and some students stammer in reading. Most students claimed to be more interested in the addition of digital barcode-based illustrated letter card media, namely 83%. This research can be used as an initial needs analysis to train reading skills using media, one of which is media development in the form of digital barcode-based illustrated letter card media.*

**Keywords:** needs analysis; learning media; illustrated letter cards digital barcode

### ABSTRAK

Penelitian ini dilatarbelakangi oleh rendahnya keterampilan membaca permulaan siswa kelas I sekolah dasar. Banyak siswa mengalami kesulitan mengenali huruf, membedakan huruf yang mirip, serta merangkai suku kata, yang disebabkan oleh keterbatasan fasilitas, minimnya dukungan orang tua, dan penggunaan media pembelajaran yang masih konvensional. Penelitian ini bertujuan untuk menganalisis kebutuhan awal pengembangan media sebagai upaya untuk meningkatkan keterampilan membaca siswa sekolah dasar. Metode yang digunakan dalam penelitian adalah deskriptif kualitatif dengan instrument penelitian berupa observasi, angket, dan wawancara. Teknik analisis data yang digunakan meliputi reduksi data, penyajian data, dan penarikan kesimpulan. Berdasarkan hasil analisis data instrumen kebutuhan awal diketahui bahwa kemampuan membaca

siswa masih rendah dengan persentase 40%. Kesulitan dalam membaca permulaan tersebut meliputi sebagian siswa belum mengenal huruf, siswa tidak dapat membedakan huruf yang bentuknya hampir sama, siswa tidak dapat merangkai suku kata, dan sebagian siswa terbata-bata dalam membaca. Sebagian besar siswa mengaku lebih tertarik dengan tambahan media kartu huruf bergambar berbasis barcode digital yaitu sebanyak 83%. Penelitian ini dapat digunakan sebagai analisis kebutuhan awal untuk melatih keterampilan membaca menggunakan media yaitu salah satunya pengembangan media berupa media kartu huruf bergambar berbasis barcode digital.

**Kata Kunci:** analisis kebutuhan; media pembelajaran; kartu huruf bergambar; barcode digital

## INTRODUCTION

The Education is an extremely important activity in human life. Since birth, a person has received education, and the first learning is obtained from the family. Parents will provide their children with teachings related to spirituality and knowledge such as reading, writing, and simple arithmetic, (Ardiansa et al., 2023). The family and community environment becomes the main source of learning before a child enters school age. According to the Republic of Indonesia Law No. 20 of 2003 Article 1 Paragraph 1 on the National Education System, education is an effort designed to create teaching and learning activities that actively encourage students to develop their potential, society, nation, and state. Based on that law, education in Indonesia is carried out in a planned manner to prepare students as the next generation of the nation. Students are also expected to take an active role in the learning process so that they can develop their potential, which is beneficial for society. Self-potential is an individual's innate ability that has not been fully explored and can be developed if it receives support from the environment, training, and adequate facilities (Azmi et al., 2024).

Basic education aims to provide knowledge, attitudes, and basic skills. Elementary school is an early stage of education that is considered an important foundation, where every child will be educated and undergo the process of education and learning. Education at the elementary level plays a crucial role in shaping the foundation of students' knowledge, particularly in terms of literacy and numeracy skills (Herut, 2024). At this stage, the introduction of letters and words becomes a very crucial aspect because it is directly related to students' reading and writing abilities. Reading skills become a concern for parents and are considered important in the learning process (Sitalawati et al., 2022). This is evidenced in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 22 of 2016 concerning the standards for basic and secondary education processes, which states that in preparing lesson plans, one must pay attention to the principle of a reading culture designed to enhance reading interest, reading comprehension, and expression in various forms of writing. Reading ability is one of the subjects in the field of elementary school education, reading is the initial foundation so that children can understand the material that will be delivered by the teacher (Ramadani L.C. et al., 2024). Reading is a window to the world, an activity that can be done by looking at writing and processing to understand the contents of a text out loud or in the heart is reading, and reading is a window to the world, this is a saying that we often read in institutions that focus on the field of education or in public places, (Azizah et al, 2022).

In addition to learning motivation, the initial step to develop and optimize the potential of lower-grade elementary school students is mastering the ability to read at the beginning level (Istiq'faroh & Ahdhianto, 2020). Reading comprehension is very important for lower-grade

students. Without understanding the necessary information, students' knowledge will not be formed in the learning process (Melisya et al., 2023). Therefore, reading can be said to be a fundamental skill that students must master, especially in early childhood classes. Reading will help students advance more easily in their learning, and they will not encounter problems when moving on to the next level (Modesta et al., 2024).

The reading skills of students in Indonesia are still considered low. Based on the national Alibaca index survey (reading literacy activity), Indonesia falls into the low literacy activity category. At the provincial level, 9 provinces fall into the moderate category, while 24 others fall into the low category (Head of the Center for Educational and Cultural Policy Research, 2019). In addition, the 2018 Program for International Student Assessment (PISA) survey showed that Indonesia ranked 74th out of 79th countries in terms of reading ability (Fauziah & Lestari, 2018). Although Indonesia's ranking in reading ability rose to 71th out of 81th countries in 2022, the achievement in reading literacy actually declined compared to 2018 due to the impact of the Covid-19 pandemic (OECD, 2023). This data reinforces that the reading literacy level in Indonesia is still at a low level.

Based on an interview with the first-grade teacher at SDN Krian 2, it shows that the number of first-grade students is 28, with a distribution of reading abilities: 15 students are fluent readers, 8 students have moderate reading skills, and 5 students cannot read. This indicates that many students still have difficulties in reading. The difficulties in early reading include some students not recognizing letters, students being unable to distinguish letters that look almost the same, students being unable to blend syllables, and some students stuttering while reading. This is caused by several internal and external factors, such as the disruption of pre-primary education due to family economic conditions, and the busyness of parents who never accompany students in studying at home, classroom facilities that are inadequate, making it difficult for teachers to conduct additional lessons because the classes are on a rotating schedule, and the large number of students makes it hard for teachers to manage time for individual tutoring. In addition, teachers have not fully utilized varied learning media to enhance the beginning reading skills of elementary school students.

Based on the above problem, it is necessary to develop appropriate learning media to improve students' beginning reading skills. Media play an important role in attracting students' attention to learn to read (Alpusari et al., 2021). Teaching reading skills can use media that makes students interested in learning along with clear pictures or illustrations to help students understand the reading flow ((Djaga et al., 2020). Learning media is a source of education besides the teacher, referred to as the distributor or connector of learning messages conveyed or created by educators in a planned manner (Rosalianisa et al., 2023). Engaging learning media that aligns with students' developmental stages can enhance the beginning reading skills of first-grade students. First-grade elementary school students are generally at a cognitive development stage that requires creative and interactive learning media to help them recognize and memorize letters and words effectively. The cognitive development of first-grade students is more interested in learning to use and present objects through words or images (Cahyanti et al., 2023). The stimulating function inherent in media can be utilized by teachers to create a learning process that is enjoyable and not boring. This condition can occur if the media presented by the teacher is something new and has never been known by the students, both in physical and non-physical appearances (Pranowo, 2021).

One of the media that can be used to support this learning process is illustrated letter cards. This media has visualizations that can help students recognize letters more quickly through relevant images. The use of visual media can be a solution for learning reading skills at the beginning of grade I in elementary school (Azizah et al, 2022). However, with the advancement of technology, there is a need for more modern and interactive learning media to adapt to the developments of the digital era, while also increasing students' interest in learning. The development of illustrated letter cards based on digital barcodes is one of the relevant solutions to meet this need. This media combines image visualization with digital barcode technology, allowing students not only to see letters and images but also to obtain additional information through barcode scanning. The barcode can be connected to interactive digital content, such as pronunciation audio, word examples, or even videos related to the displayed images. The use of digital barcode-based media is expected to enhance motivation and interactivity in learning, making students more active in the learning process, as well as providing variety in enjoyable and innovative teaching methods. The novelty in this research lies in the development of digital barcode-based picture letter card learning media, which has not been widely applied in early reading learning. This research integrates digital barcode technology to create a more interactive learning experience. With the barcode scanning feature, students not only recognize letters through images, but can also access additional digital content, such as audio, word examples, and supporting videos. This innovation aims to increase motivation, interactivity, and effectiveness of beginning reading learning in the digital era.

Before the development of this media is carried out, an initial needs analysis must be conducted to ensure that the media to be developed truly aligns with the characteristics of first-grade students, the applicable curriculum, and the needs of teachers in the teaching process. According to the Modified Research and Development Model theory explained by Plomp (Anggit et al., 2017), the initial stage that must be conducted in development research is the preliminary investigation phase. In this phase, it is limited to needs analysis based on initial field observations and a review of relevant literature related to this research. A similar point was made by (Wulandari et al, 2022) who referred to the Borg & Gall development research model, stating that the first stage in product development is research and information collecting. At the initial needs analysis stage, the researcher conducts observations to gather information about reading ability issues in elementary schools, their causes, and alternative solutions needed to address these problems. In addition to the initial needs analysis for media development, an analysis of the necessary digital technology devices and software must also be conducted through exploratory studies and literature reviews (Kartikaningrum, D. M., et al., 2023). Thus, the subsequent stages of media development can be carried out more effectively and efficiently. The objectives of this needs assessment research are: (1) to collect information about the problems that occur in the reading ability of elementary school students, (2) to describe the initial needs analysis to develop learning media, and (3) to determine one alternative learning media that is in accordance with learning materials and student characteristics.

## **METHODS**

### **Type and Design**

This research is a study of the initial stage of media development, namely the needs analysis stage. This research is a type of qualitative research with a descriptive design. What is meant by a descriptive method is a method that attempts to describe the facts as they are (Arikunto, 2010). This research used a descriptive qualitative approach with several stages. First, data were collected through observation, interviews, and questionnaires using instruments such as observation sheets, interview guides, and questionnaires. Furthermore, the data obtained were analyzed through three stages, namely data reduction to filter relevant information, data presentation in the form of tables or descriptions, and conclusion drawing based on research findings. The results and discussion of the research outline the need for developing learning media to improve students' reading skills.

### Data and Data Sources

This research was conducted in the odd semester of the 2024/2025 academic year at SDN Krian 2, Krian District. This study involved 28 grade I students of SDN Krian 2 as research subjects, consisting of 15 male students and 13 female students. The research subjects were selected using purposive sampling technique, which is to select respondents who are considered relevant to the research objectives, in this case grade I students who have difficulty reading. The selection of this subject was based on preliminary data which showed that many students had difficulty in recognizing letters, distinguishing similar letters, and stringing syllables. From the interview with the class teacher, it was found that out of 28 students, 12 students read fluently, 3 students read less fluently, 8 students still had difficulty reading, and 5 students could not read at all.

### Data collection technique

Data collection techniques used include data reduction, data presentation, and drawing conclusions. Research instruments are measuring tools for collecting data used in research. The instruments used by researchers in this preliminary study were interview sheets, observation guide sheets, and questionnaire instruments. Interviews are used as a technique in collecting data by researchers from teachers with the aim of knowing the learning process in the classroom. Researchers also asked about the use of media and reading skills in learning. Observation is used as a data collection technique that has specific characteristics from other techniques (Sugiyono, 2019). Researchers carried out observations with the aim of observing the analysis of reading ability needs and the learning media needed. This was further supported by a questionnaire instrument or questionnaire which was carried out by giving a set of questions or written statements to respondents, namely class I students at SDN Krian 2. The indicators used in the questionnaire instrument to explore data include: reading ability, interest in reading activities, difficulty in stringing syllables, the use of media in reading learning, and the effectiveness of media use in overcoming reading difficulties.

Table 1  
Teacher Interview Questions

No	Question
1	What are the obstacles for students who find it difficult to read?
2	If there are students who have difficulty reading, what follow-up action will the homeroom teacher take to deal with this?

- 3 Does the homeroom teacher teach students who have difficulty reading using media?
- 4 What media to use with students who have difficulty reading?
- 5 What media is needed to limit students who have difficulty reading?
- 6 Does the homeroom teacher know about digital barcode-based picture letter card media?
- 7 Do the homeroom teachers think that the use of digital barcode-based picture letter card media is effective and do the homeroom teachers agree with the development of this media?
- 8 According to the homeroom teacher, what needs to be developed in digital barcode-based picture letter card media in order to overcome students' reading difficulties?

Table 1 above contains a list of interview questions addressed to homeroom teachers to explore obstacles, actions and needs related to students' difficulties in reading. This table consists of eight questions designed to elicit information regarding the main obstacles that cause students to have difficulty reading, the follow-up carried out by the homeroom teacher to overcome students' reading difficulties, the use of learning media by teachers to help students who have difficulty reading, the types of media used has been used and the media needed to help students read, teachers' knowledge about digital barcode-based picture letter card media, teachers' opinions about the effectiveness and their agreement with the development of this media, aspects that need to be developed in digital barcode-based picture letter card media so that it is more effective in overcoming students' reading difficulties. Table 2 aims to obtain input from teachers regarding the use of innovative learning media in helping students who have difficulty reading, as well as to identify potential development of this media

### Data analysis

Researchers used qualitative descriptive data analysis techniques. The research results presented are the results of interviews, observations, and questionnaires, namely the results of analysis of students' initial reading abilities, follow-up actions that have been used by teachers, and the need for learning media for reading skills. Through interviews and observations carried out by researchers with class I teachers, the following data was obtained:

Table 2

Student's Reading Ability	
Student's Reading Ability	Amount of student
Fluent	12 students
Not that smooth	3 students
Not smooth	8 students
Can't Read	5 students
<b>Amount of student</b>	<b>28 students</b>

Based on table 2 above, it shows that the number of class I students is 28 students with a distribution of reading abilities, namely 12 students read fluently, 3 students do not read fluently, 8 students do not read fluently, and 5 students cannot read. This shows that there are still many students who experience difficulties in reading. This shows that there are still many students who experience difficulties in reading so further research is needed.

## RESULTS AND DISCUSSION

In these results and discussion, the researcher presents the data that has been obtained by providing an explanation in the form of a description. The results of the initial needs data analysis show that the learning media used in grade I elementary schools is still limited to conventional media such as printed books and simple letter cards. Based on a survey of teachers and students, it was found that students need more interesting and interactive learning media to increase their motivation and understanding in recognizing letters and words. Teachers also stated that the use of technology, such as digital barcodes, could be an effective innovation in supporting the teaching and learning process. Therefore, the development of digital barcode-based graphic letter card media is a relevant solution to meet these needs.

Table 3  
Results of Analysis of Interview Answers with Teachers

No	Answer Analysis Results
1	Difficulties in beginning reading include some students not knowing letters, students not being able to differentiate between letters that have almost the same shape, students not being able to string together syllables, and some students stuttering when reading.
2	If there are students who have difficulty reading, then what the teacher does is provide additional learning after school in the school hallway, attaching letters to blackboard decorations and wall decorations, using alphabet letter cards as media, and directing the students' parents to accompany the children. children study at home.
3	The homeroom teacher teaches students who have difficulty reading using letter cards and a book entitled reading fluently in 30 minutes
4	The media used by homeroom teachers is letter card media
5	In the opinion of the homeroom teacher, the media needed by students who have difficulty reading is media that contains images, sound and video
6	The homeroom teacher has heard of the name of the digital code-based picture letter card media but does not yet know the contents clearly and how to use the media
7	In the opinion of the homeroom teacher, some of the information that has been heard and understood from researchers regarding kargamcodi media, the use of kargamcodi media is quite effective in overcoming reading difficulties in accordance with the purpose of creating this media, namely to overcome students' reading difficulties. The homeroom teacher also agrees with the development of this media, because it can be a tool to help students with reading difficulties
8	In the opinion of the homeroom teacher, what needs to be developed from kargamcodi media is that the material can be made as interesting as possible, there are more pictures and videos that can attract students' attention and increase students' enthusiasm to see it.

Based on table 3, difficulties in beginning reading include some students not knowing letters, students not being able to differentiate between letters that have almost the same shape, students not being able to string together syllables, and some students stumbling when reading. This is caused by several factors, both internal and external, such as obstacles to pre-primary school education due to the family economy, busy parents who never accompany students to study at home, inadequate classroom facilities so that teachers find it difficult to carry out additional lessons because the classes take turns, and the large number of students so that teachers find it difficult to arrange time to provide individual assistance. Apart from that, it is also necessary to use varied learning media to improve elementary school students' initial reading skills so that students do not get bored. The teachers who have been interviewed are 6 class teachers according to the rombongan in the school.

In the interview, it was also conveyed that the follow-up actions that had been used by teachers to improve students' reading skills were additional learning after school in the school hallway, affixing letters to blackboard decorations and wall decorations, using alphabet letter cards as media, and directing students' parents to accompany them. children study at home. However, there are still many students whose reading skills are still low. This shows that it is necessary to provide learning media that makes students more focused and enthusiastic in reading.

Table 4  
Questionnaire and Results of Student Needs

No	Question	Frequency		Percentage	
		Yes	No	Yes	No
1	Can you read?	12	16	43%	57%
2	Are you interested and like reading activities?	15	13	54%	46%
3	If you can or cannot read, do you have difficulty putting syllables together?	18	10	64%	36%
4	Do you or your homeroom teacher use media when teaching reading?	16	12	57%	43%
5	Do you think the use of media is effective in overcoming reading difficulties?	23	5	82%	18%

In Table 4, the results of a questionnaire are presented which aim to determine students' needs regarding reading ability, interest in reading activities, and the effectiveness of using media in the learning process. The data presented consists of five main questions with answers of "Yes" or "No," accompanied by the frequency and percentage of each answer. This table provides an important picture of the condition of students' reading abilities, interest in reading activities, as well as the role and effectiveness of the learning media used by teachers. This data becomes a reference in designing learning strategies that are more appropriate to student needs.

Table 5  
Student Questionnaire Analysis Results

No	Results of Analysis of Student Questionnaire Answers
1	43% of students can read



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|---|--|
| 2 | 54% of students are interested and like reading activities   |
| 3 | 64% of students who have read or who have not read still find it difficult to put syllables together |
| 4 | 57% of students said that the homeroom teacher used media when teaching reading                      |
| 5 | 82% of students agree that the use of media is effective in overcoming reading difficulties          |
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Based on table 5 from the results of the analysis of student questionnaire answers, 43% of students have the ability to read, while 54% of students feel interested and like reading activities. However, 64% of students, both those who can read and those who cannot yet, still experience difficulty in combining syllables. As many as 57% of students stated that their homeroom teacher had used media to teach reading skills. In addition, the majority of students, 82%, agreed that using media could help overcome difficulties in reading, especially in combining syllables. From this data, it can be concluded that the use of media in learning to read is considered effective by the majority of students, although there are still students who need more support to improve their ability to put syllables together so that the process of learning to read becomes smoother and more effective.

## CONCLUSION

This study shows that grade 1 students' beginning reading skills still need to be improved, with various obstacles such as letter recognition, differences in letter shapes, and syllable arrangement. Internal and external factors, such as lack of access to pre-school education, lack of parental support, and limited school facilities, affect students' reading skills. The survey results revealed that the majority of students had difficulty in stringing syllables together, although 82% stated that the use of learning media was effective in helping them. Therefore, the development of learning media that is more varied and in accordance with students' cognitive development, such as digital barcode-based illustrated letter cards, is a relevant solution. Future research can test the effectiveness of this media implementation in improving students' reading skills more broadly.

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