



## The Effectiveness of Flashcard Media and Letter Learning Applications to Help Dyslexic Children's Reading Ability in Elementary School

Syifa Mutiara Puradireja \*

Universitas Pendidikan Indonesia, Indonesia



[shifamutiara3@upi.edu](mailto:shifamutiara3@upi.edu)\*



10.33086/cej.v4i1.2834

Submission : April 6, 2022

Revision : June 8, 2022

Accepted : September 6, 2022

---

### Keywords

Disleksia,  
Flashcard,  
Aplikasi  
'Belajar  
Huruf'

---

### Abstract

Membaca menjadi salah satu kemampuan yang penting dan sering diajarkan di sekolah dasar. Biasanya kesulitan belajar yang sering ditemukan yaitu kesulitan membaca (disleksia). Artikel ini mencoba menggali karakteristik kesulitan yang dialami siswa disleksia dalam proses membaca di sekolah, serta upaya mengatasi kesulitan membaca untuk siswa disleksia di sekolah dasar melalui media flashcard dan aplikasi 'Belajar Huruf' pada smartphone. Peneliti menggunakan penelitian berjenis kualitatif dengan metode yakni studi kasus. Subjek penelitian seorang anak disleksia berusia 7 tahun berinisial APS yang bersekolah di salah satu SD Negeri di Kota Bogor. Teknik pengumpulan data yang dilakukan yaitu observasi, wawancara, dan dokumentasi. Analisis data dilakukan dengan reduksi data, penyajian data, dan penarikan kesimpulan. Temuan penelitian menunjukkan APS bisa menghafal semua huruf abjad, namun tidak bisa membedakan huruf [b] dan [d], [m] dan [n], dan mengalami kesulitan menulis beberapa huruf dan angka dengan benar. Hasil penelitian menunjukkan media pembelajaran flashcard dan aplikasi 'Belajar Huruf' dapat meningkatkan kemampuan membaca yang dialami oleh subjek penelitian. Rekomendasi hasil penelitian tentang efektivitas metode media pembelajaran kreatif flashcard dan aplikasi 'Belajar Huruf' ini dapat ditindaklanjuti dengan menggunakan aplikasi lain maupun media yang lebih menarik dengan memanfaatkan teknologi digital.

---

### Kata Kunci

Dyslexia,  
Flashcard,  
'Learning  
Letters'  
application

---

### Abstrak

Reading is one of the most important skills and is often taught in elementary schools. Usually learning difficulties that are often found are reading difficulties (dyslexia). This article tries to explore the characteristics of the difficulties experienced by dyslexic students in the reading process at school, as well as efforts to overcome reading difficulties for dyslexic students in elementary schools through flashcard media and the 'Learn Letters' application on smartphones. The researcher uses a qualitative type of research with a case study method. The subject of the study was a 7-year-old dyslexic child with the initials APS who attended one of the public elementary schools in the city of Bogor. Data collection techniques used are observation, interviews, and documentation. Data analysis was carried out by data reduction, data presentation, and drawing conclusions. Research findings show that APS can memorize all the letters of the alphabet, but cannot distinguish the letters [b] and [d], [m] and [n], and has difficulty writing some letters and numbers correctly. The results showed that the flashcard learning media and the 'Learning Letters' application could improve the reading skills experienced by the research subjects. Recommendations from research results on the effectiveness of the flashcard creative learning media method and the 'Learning Letters' application can be followed up by using other applications or more interesting media by utilizing digital technology

## A. Introduction

One of the biggest problems in education is learning difficulties. Learning difficulties are students' difficulties in receiving or absorbing lessons at school. The research findings show that the most common learning difficulties in the field are reading difficulties or dyslexia. This study intends to address learning difficulties in dyslexic children. Dyslexia is learning difficulties in decoding, reading, spelling, and reading fluently (Snowling et al., 2020). People with dyslexia have difficulty in word processing which results in hampered reading. These learning difficulties should be given special measures so that children can complete their learning at school. This study uses flashcard media and the 'Learn Letters' application as a solution for handling dyslexic children. Flashcards are a very familiar tool used in language learning, especially in learning, understanding, and memorizing letter shapes, sounds, and vocabulary (Wen et al., 2020). The research conducted by Loflin (Loflin et al., 2020) revealed that many teachers and researchers have proven that using flashcards to teach students to memorize and remember letters is effective.

The reason for choosing flashcard media is because flashcards have concrete properties, help clarify letters, are easy to make, and are easy to use. Researchers made innovations on flashcards, namely simple flashcards made of HVS paper cut into eight parts for uppercase letters and 16 for lowercase letters. The author made it from 5 HVS into 52 parts, with 26 parts to make uppercase letters and 26 for lowercase letters. The flashcard the author made only has one side, the front side for writing colored letters. However, researchers found a weakness from previous research: children become bored if they continue to use flashcards in learning. To avoid children's boredom in learning to use flashcards, researchers also use the 'Learn Letters' application which is designed in such an attractive way for children's reading power. Suppose the child finishes learning to use flashcards. In that case, the evaluation researcher uses the games in the 'Learning Letters' application to find out developments in understanding and memorizing the shapes and sounds of letters. The 'Learning Letters' application was released on October 14, 2016 by Solite Kids programmer. This application is one of the small learning series that is packaged interestingly and interactively specifically for Indonesian children. In the 'Learning Letters' application, it is equipped with sound so that it helps children in honing their auditory intelligence. This letter learning serial application helps children to learn to recognize letters from A to Z in a fun way. In addition to learning, this application can also be used to play because it contains a variety of games that are used as playing strategies to eliminate boredom and can guide students to be active and enthusiastic in learning by providing fun stimuli (Fernanda et al., 2017). This application is designed to encourage literacy in dyslexic children involving topics such as recognizing letters, memorizing letters, remembering letters, writing letters, and sounding letters correctly (Yedra & Aguilar, 2022). Educators, dyslexic children, and parents can also use this application to stimulate learning activities at home (Cidrim et al., 2018).

Reading difficulties experienced by students can be caused by brain disorders related to the ability to learn to read and write, as observed in learning disabilities (Vasconcellos, 2018). Learning difficulties for dyslexic children are not only difficulties in reading and writing but also difficulties in listening to instructions, ability in expressive language, the ability to read a series of numbers, numeracy skills, memory skills, understanding musical rhythms, singing,

and so on. In addition, children who have dyslexia have not been able to distinguish some letters of the alphabet, such as the letters [b] and [d], [p] and [q], [m] and [w]. They also have difficulty spelling or reading specific series of letters, for example, “mother” to “yam”. Difficulties experienced by children with dyslexia must be paid special attention. If left unchecked, it will have an impact on learning activities. Teachers must understand dyslexia at a cognitive level because a cognitive function can be developed through effective learning activities (Knight, 2018). In this case, the teacher's role in printing cognitive aspects is an important part of the child's cognitive development process (Metaphysics, 2019).

This study aimed to prove the effectiveness of flashcard media and the 'Learning Letters' application in dyslexic children. The researcher analyzed the type of case study on a dyslexic boy named APS. To determine the initial reading ability of APS before the study took place, the researcher carried out observations by asking him to read and write. Data on the ability to read APS as follows:

**Table 1.1 APS Reading Ability Data**

Data	Instructions	Result
1	The researcher pointed to the letter [d]	APS mentions the letter [b]
	The researcher pointed to the letter [b]	APS mentions the letter [p]
2	Read text “Api”	Read text “Abi”
3	Read text “Nina”	Read text “Mima”
4	Write the letter [b]	Write the letter [d]
	Write the number 3	Write the symbol $\epsilon$
	Write the number 6	Write the symbol $\partial$

Based on the table above, it can be seen that APS has difficulty recognizing letters, spelling letters, and mentioning letters. APS also writes letters and numbers in reverse. Research on reading skills is significant for dyslexic children because the difficulties they experience will hinder their smooth learning. However, the difficulty in reading can be overcome with therapy. In the future, it is hoped that dyslexic children can be minimized. Educators need to use flashcard media to improve student learning to read. The use of flashcard media can make it easier for educators to deliver learning materials, for students to increase students vocabulary and make learning fun and motivate children to actively participate in learning activities so that there is positive interaction between teachers and students, students and students and students with learning media. (Ika et al., 2020). The combination of flashcard media with learning the 'Learning Letters' application is suitable for the learning process (Fitriani et al., 2021).

Flashcard media in this study was used to help make it easier for children to recognize letters separately. Flashcard is a learning media that contains aspects regarding visual aspects and motor aspects. However, apart from only using flashcards, it needs to be supported by the 'Learning Letters' application, which can hone creativity and attract attention to bring up children's joy in learning. Because if you only rely on flashcards, children will get bored quickly. This means that the 'Learning Letters' application is expected to be the peak of learning for dyslexic children to evaluate the material obtained with various games that hone memory.

Being an educator who knows and understands flashcard media can improve the ability of dyslexic students in elementary school to read. Therefore, in this study, the researchers wanted to know about the efforts made by researchers to deal with learning difficulties in dyslexic children. Researchers innovate about media that educators have used to deal with

reading difficulties. So that it can be seen that flashcard media and the 'Learning Letters' application can improve APS ability in reading. Related to the above, this article discusses the purpose of the forms of learning difficulties experienced by APS, the application of flashcard learning media and the 'Learning Letters' application on smartphones, and the results of the application of flashcard learning media and the 'Learning Letters' applications on smartphones in dealing with students with dyslexia.

## B. Methodology

The type of research and the method used in this research is a qualitative method with a case study type. In qualitative research, ethical considerations have a particular resonance due to the in-depth nature of the study process (Roshaidai & Arifin, 2018). This type of case study was chosen because in the case study method that the researcher used, the emphasis was on extracting and solving problems by carrying out solutions accompanied by analysis involving various sources of information. This study aimed to determine the effectiveness of flashcard media and the 'Learn Letters' application in dealing with dyslexic children.

The instrument used is an observation by means of researchers first collecting data related to problems in learning. The next step is diagnosing the cause of the difficulties experienced by students. Furthermore, the researchers selected the object of research, where the case raised was the case of dyslexia experienced by students. Furthermore, the researchers collected data from the object, namely how students were in the classroom, and outside the classroom, data on the development of these students, how the condition of students with their parents, data obtained from parents, and data obtained from teachers. Furthermore, the researcher predicts from the data what strategies or learning methods are appropriate to overcome these problems. To make it easier to understand, the researcher made the research implementation flow chart.

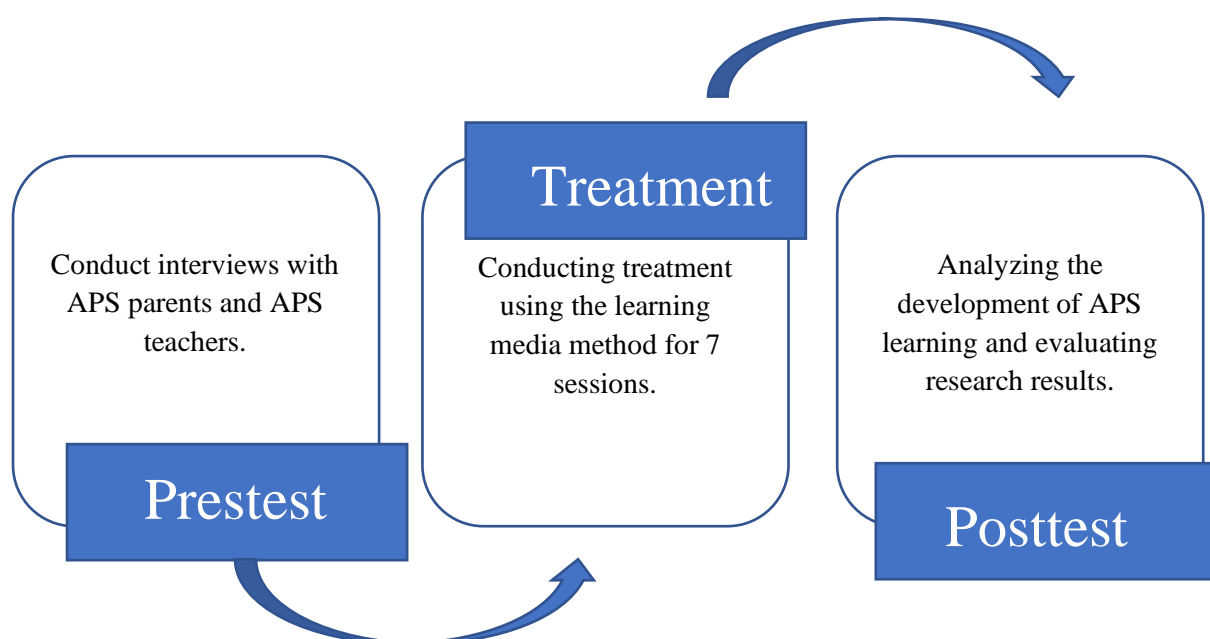


Figure 2. 1 Research Stage Chart

Based on the chart, during the pretest, namely before the study, the researcher conducted interviews with APS parents and APS homeroom teachers to find out the learning conditions and difficulties faced by APS. Furthermore, at the time of treatment, namely during treatment, the researchers carried out treatment using the learning media method for seven sessions to overcome learning difficulties experienced by APS. Finally, the post-test stage is after the research, where the researcher analyzes the development of APS learning and evaluates the study results, which can be obtained as to whether or not the method used by the researcher is effective.

In the case study method that the researcher uses, the emphasis is on extracting and solving problems by carrying out solutions accompanied by analysis involving various sources of information. Data analysis is done by descriptive. This study is devoted to case studies of creative learning methods with flashcard media and the 'Learn Letters' application on smartphones.

**Table 2.1 Subject Characteristics**

No	Name	Age	Weight	Height	Birth History
1	APS	7 <sup>th</sup> years	22kg	110cm	Premature

Based on the table, it is known that the subject of this study is a 7-year-old boy with the initials APS who attends a public elementary school in Bogor City, West Java who has dyslexia. Data were collected through observation techniques, interviews and documentation. The interview technique was conducted by interviewing APS parents about the difficulties experienced by APS while studying and interviewing APS homeroom teachers about the development of APS learning at school. The questions asked about APS are presented in the following table.

**Table 2.2 Interview Report**

Question	Answers APS Parents	Question	APS Homeroom Answer
What learning difficulties does APS experience while reading?	Not memorized all the letters, often confused between letters [b] and [d], letters [m] and [n], read words backwards, and wrote letters backwards.	How is the progress of learning APS at school?	Difficulty in reading, writing that is still upside down, but he is a diligent and enthusiastic child in learning.
How to deal with the difficulties experienced by APS?	Initially wanted to stop APS schools, but still tried to provide additional reading lessons for APS.	What are the methods used in dealing with the difficulties experienced by APS?	By giving special lessons at the teacher's house, dictating letters slowly, copying writing, and writing words as directed.

## C. Result and Discussion

### Forms of Learning Difficulties Experienced by APS

The through interviews with APS parents as well as observations, it was found that the subjects of the study had problems, namely they often wrote letters and numbers backwards. The findings show that the subject has problems writing the letter [g] to [e], 7 to [Γ], the letter [b] to [d]. Then misrecognize letters, sound letters, and spell letters. Another obstacle is that he is easily distracted, such as doing assignments from his teacher, then distracts him by watching

YouTube and playing games. According to APS's mother, who said "It takes a long time for him to write, at that time he wrote for up to 2 hours, only doing 5 questions, because he watched YouTube later if he was reprimanded, then he continued writing again". Based on the narrative of APS's parents, it was found that the research subject had written for two hours just to write 5 questions because he was easily distracted by other things. Apart from these two things, APS always uses his mood when studying. This means that his learning condition is also influenced by his mood, if his mood is bad, he will firmly refuse to study. If ordered to write, he will complain of being tired, and say "Well, Mother wrote it". However, according to the parents of APS who said, "But if he was asked to write to someone, for example, his teacher, he wanted to, but if he was asked to do so, he would find it difficult to do so. That's how the child is moody again." Through this narrative, the subject will actually be very obedient if he is ordered by other people, especially the teacher. In addition, he also feels inferior with his friends because he has difficulty reading. Based on an interview with APS's mother, she said "Actually, her father told me to let her (APS) stop going to school because she can't read. But I said just try it first". According to the results of the interview with APS's mother, there was a choice that APS' father had wanted to dismiss APS school because of this difficulty. However, APS's mother refused in the hope that APS would recover and later APS would be able to. The subject also showed an attitude of insecurity because his father often mocked him for not being able to read. But when he is motivated, he also wants to show that he is smart and show it to his father.

The second thing is that the researcher conducted interviews with the homeroom teacher of APS at school. According to his statement, "It's really good and smart. Wants to learn, wants to try even though he has difficulty reading, but he tries to listen well for example when he is asked to write he will have difficulty with dictation mode, but I gave a solution by telling him to copy it while reading it so that he will remember more easily. Perhaps the difficulties experienced by APS are because now learning is all online, so children are not monitored and cannot be guided intensively, so that is suspected of hampering their learning development." It can be concluded, APS is a good and intelligent child. However, he has learning difficulties, especially in reading. The APS homeroom teacher said that the reading difficulties experienced by APS were partly due to online learning, so the homeroom teacher was unable to fully and specifically reach out to children's learning development. Fortunately, APS and its homeroom teacher are not too far away, only blocked by a few houses, so the APS homeroom teacher can take a pedagogical approach and has the initiative to hold school lessons at the home of his homeroom teacher with the aim of reaching his students who have learning difficulties. School lessons are held twice a week, on Tuesdays and Saturdays. According to him, although APS cannot read yet, the way of learning that he applies to APS is to write by imitation. It is indeed difficult for APS to write by dictation, but by copying the writing given by the teacher, according to the APS homeroom teacher, it is highly commended because there is an effort within APS to complete the task given by the teacher. Even though the writing contained letters that were upside down and did not match the example, the homeroom teacher really appreciated it. Apart from that, APS is also moody in learning, as stated by APS's mother. If he wants to learn then he will study well, but if he doesn't want to learn then he can't be forced because he will get angry if someone forces him to do anything.

The third thing is that researchers make direct observations of APS. The condition of APS before giving the action is that APS has not been able to recognize the shape and remember the letters [b], [c], [d], [j], [k], [m], [n], [p], [q], [r], [t], and [v]. He is also still often confused between the letters [b] and [d], the letters [m] and [n], and the letters [p] and [b]. When pronouncing the letters of the alphabet from a-z, there are still many missing letters that he doesn't read including the letters [n], [r], [t], and [v]. In data 2 in the observations that the author made, namely when the test reads the word 'Fire', APS actually reads 'Abi'. From these data, it can be seen that APS has difficulty recognizing the letter [p] if it is in a word, so he reads it into the letter [b]. The word that should be read 'Fire' but because of the difficulty in sounding the letter [p] so it becomes [b] so he reads it as 'Abi'. Furthermore, in data 3, the observations made by the researchers were when the test read the word 'Nina', APS actually read 'Mima'. Actually, he knew it was the letter [n] after being given the keyword 'tasty', but when he started to spell it by combining the phonemes of the letters [n] and [i] which read [ni], APS instead spelled it into [mi]. Likewise, when spelling the letters [n] and [a] which read [na], APS actually spelled it as [ma]. From the two data, it can be seen that APS has difficulty recognizing and sounding letters in spelling. From these two data, it can also be concluded that APS still has difficulty reading in sounding letters, especially if the letters are it's almost like the sound of the phoneme. Based on data analysis and research findings, research subjects can be categorized as dyslexic with Phonological Dyslexia type with mild dyslexia severity. Implementation of Flashcard Media Strategy and 'Learning Letters' Applications.

APS is a child who is active in playing. In his daily life, he always spends his time playing, both playing with his friends and playing with his parents' smartphone. Of course this is very time consuming and hinders the learning process. Judging from the problems experienced by APS, the strategy that researchers use in dealing with dyslexic children, especially in this study is APS, namely the strategy of using learning media that supports the learning process. In this case, the researchers focused on using flashcard media or letter cards and the 'Learn Letters' application media on smartphones in helping dyslexic children recognize letters, sound letters, distinguish letters, arrange letters into words, spell words, read words, and write letters correctly. without inverting according to the order of writing letters. This flashcard media aims to hone the memory of dyslexic children in recognizing letter shapes and letter sounds. On the flashcard will be written the letters A-Z, with capital letters, and also with lowercase letters. How to use this flashcard, namely:

- a. Arrange flashcards starting from A to Z in order. Try to order according to the alphabet song to make it easier for students.



**Picture 4. 1 APS Is Making Flashcards**

b. The next step is to ask the children to listen to the researcher's instructions, namely the researcher says a word, for example [stone]. Then the researcher ordered him to spell the word [stone] first to make it easier for him to arrange the letters. If he has difficulty, the writer helps him to spell by giving emphasis to the letter in question. If the articulation spoken by the researcher is clear, it will be easy for him to catch the letters that were emphasized earlier. After he managed to arrange the word, then instruct him to spell and read by combining the syllables. If he succeeds in following, appreciation by praising him is smart, this will increase his confidence and enthusiasm for learning.

In the 'Learning Letters' application there are two menus, namely the learning menu and the play menu. For the learning process, the researcher chose the learning menu where in the learning menu there were 4 sub menus including:

a. Learn the letters one by one.

In this submenu, the letters of the alphabet are presented one by one in uppercase and lowercase letters sequentially starting from the letters A to Z. In this submenu there is also the author's voice in sounding the letters to help children sound the letters. For example, when opening this submenu, the letters [A] and [a] are immediately presented and the author immediately sounds the letters so that children are not confused in sounding the letters.

b. Recognize all letters.

In this submenu, the letters of the alphabet from A to Z are presented. There is also a choice of uppercase and lowercase letters. In this submenu slightly different from the first submenu. If the first submenu automatically sounds the letters, but in this submenu the sound will sound when the child presses the letters displayed on the screen. Children can explore which letters he wants to listen to as he pleases. For example, he has memorized the letters [a], [b], [c], [d], [e] and he wants to know the sound of the letter [f] without having to move the screen like the first submenu, the child only presses the letter [f] and the sound of the letter [f] will be heard.

c. Learn letters and objects.

In this submenu, the letters of the alphabet from the letters A to Z along with the objects that represent these letters are presented. When the child presses this submenu, the child immediately sees the display presentation of the letters [A] and [a] along with a picture of an apple and the words 'Apple' under the picture. Automatically also the sound of the letter [a] and the sound of [apple] from the author's voice will be heard. In this submenu, there are also menu options, namely the letters of the alphabet in a row. The child only presses one letter and objects that represent it appear without shifting one by one. For example, a child wants to know the letter [y] and objects that represent the letter [y] directly without having to move the screen from the letter [a] to [y], then the letters [Y] and [y] will immediately appear along with the word that represents them, namely ' Yoyo'. This menu also makes it easier for children to find exploration and curiosity about letters and objects.

d. Learn to write letters.

In this submenu, the letters [A] and [a] are presented in the form of dots containing numbered apples and directional arrows to make it easier for children to write the correct alphabet letters without turning them upside down. Here are also available pen color options, namely blue, green, red, and black. In this menu, children are led to write correctly according



to the order of writing letters. If the child writes correctly, the correct bell will ring, and if the child writes incorrectly, the wrong bell will ring and the letter is automatically erased and repeats from the beginning until the writing is correct in order. If you have finished thickening the letters [A] and [a], a 'great' sticker will appear as a form of appreciation for the child's efforts. Then the child presses the arrow as a symbol to continue to the next section. In the next section, objects that start with the letter "A" will be presented, namely 'Dog', 'Wine', 'Chicken', and 'Apple'. After that in the next section a picture of the apple will be presented and the words 'Apple' with lines for children to thicken the line. There are also pens in various colors such as blue, green, red, and black. After the child finishes thickening, the letter will change to the next letter, namely the letter 'B' and so on.

After finishing learning, the researcher asked him to play on the play menu. In the play menu there are 15 playing submenus including: Playing Arrange Words, Completing Nouns, Writing Your Own Name, Connecting Letters, Sorting Letters, Letter Puzzles, Match Shapes, Match Letters, Letter Lights, Catch Fish, Pop Bubbles, Group Letters, Put Lids on Jars, Parking Cars, and Freight Trains.



Picture 4. 2 Display of the 'Learning Letters' Application

## 1. Results

### Changes That Happened

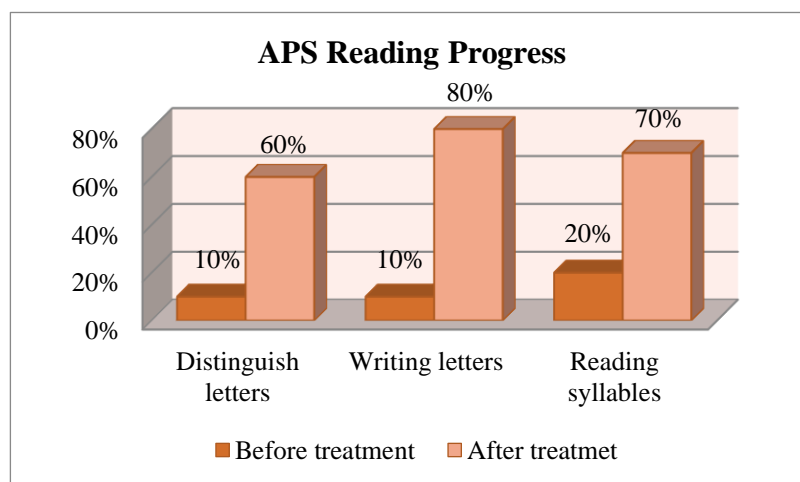
Based on research observations conducted after the study, information related to APS was obtained. The state of APS after the action was taken turned out to have changed after the researchers conducted research for seven sessions. The changes experienced by APS are not so rapid, due to limited time, but researchers really appreciate the significant changes made by APS. The results of the changes and obstacles that APS is still facing are presented in the following table.

Table 3. 1 Results of Changes and Constraints experienced by APS

No	Session	Change Result	Constraint
1.	First	APS can recognize letter shapes and remember them, including the letters [c], [k], [p], [q], [r], [t], and [v]. Already able to spell syllables and put them together into a word with the help of flashcards and reading books.	For the letters [b] and [d], the letters [m] and [n] are still confused and forgotten. APS still has difficulty arranging letters into a word from flashcard media, has difficulty writing if it is not given an example first and APS writes in reverse the letter [g] becomes [e] and letter [a] which is like the letter [q].

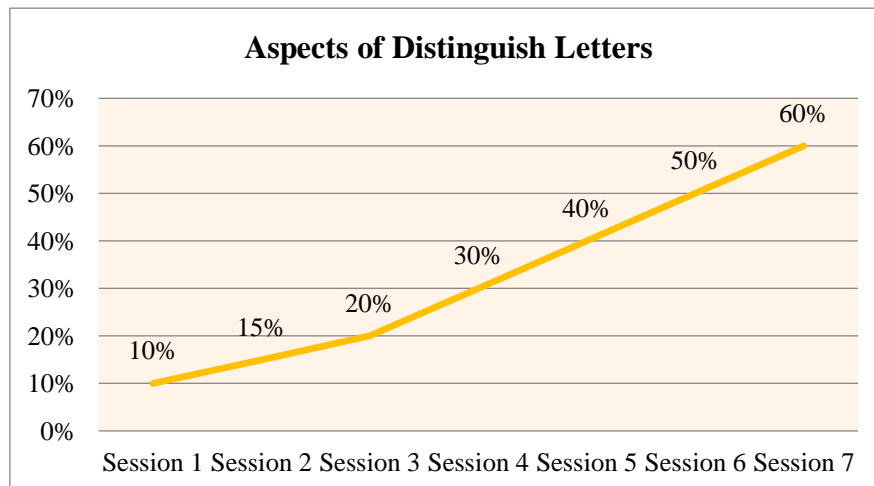
2.	Second	APS writes the letter [a] from what is still similar to the letter [q] now it can be better. Already able to distinguish the letters [m] and [n] as well as [b] and [d] in games on the 'Learn Letters' application.	In flashcards and a word, cannot distinguish the letters [m] and [n], as well as the letters [b] and [d]. Still writing numbers [7] and [9] in reverse when writing numbers.
3.	Third	APS learns to write and read from what he writes through reading books, distinguish letters [b] and [d] in flashcards and a word, spell letters into syllables, write letter [a] but must be demonstrated first.	Can't distinguish the letters [m] and [n], and can't recognize the letter [y] unless given a keyword.
4.	Keempat	APS can only arrange flashcards from letter [a] to letter [g], but when playing games arranging letters in the 'Learn The letters 'APS' application have been able to arrange the appropriate sequence of letters.	APS is still having trouble knowing which words start from the letters A to Z.
5.	Fifth	APS can say the letters [m] and [n] if a flashcard is shown. He could distinguish the letters [m] and [n] after the researcher repeated it for more than 5 minutes. APS is good at playing word arranging games by looking for missing letters and arranging words from scrambled letters on flashcards.	APS is still confused when tested again to distinguish the letters [m] and [n].
6.	Sixth	APS learned to compose their own words with the help of vowels, namely [a], [i], [u], [e], and [o] from flashcard media and succeeded in composing two syllables. APS writes the words it composes from a flashcard into a notebook. APS managed to write down the word that the researcher dictated correctly.	APS has a problem writing the letter [R] upside down. He still wrote the numbers 2 and 3 upside down. During the reading process, he still had difficulty spelling the words [and] and [write], besides that he also missed the word [you] while reading.
7.	Seventh	APS is already fluent in spelling two syllables and three syllables. He is also able to combine word for word in sentences, although he still needs help to repeat the words for him to combine. APS can also read a sentence fluently after repeated repetition. APS is able to unite words with other words so that the sentences they read are correct.	Until the seventh session, APS still cannot distinguish the letters [m] and [n] in a word and it is still upside down when spelling words.

To make it easier to see the development of APS, the researcher made a graph containing the development of APS learning between before treatment and after treatment, namely as follows:



Graph 4. 1 APS Reading Progress

Based on the observations made by the researchers, the results were quite satisfactory, namely in the aspect of distinguishing letters, it was known that before treatment had a percentage of 10%, but after receiving treatment there was an increase in the percentage to 80%. The treatment was carried out from the first session to the seventh session. Changes in the aspect of distinguishing letters from session to session are presented in the following line graph:



**Graph 4. 2 Aspects of Differentiating Letters**

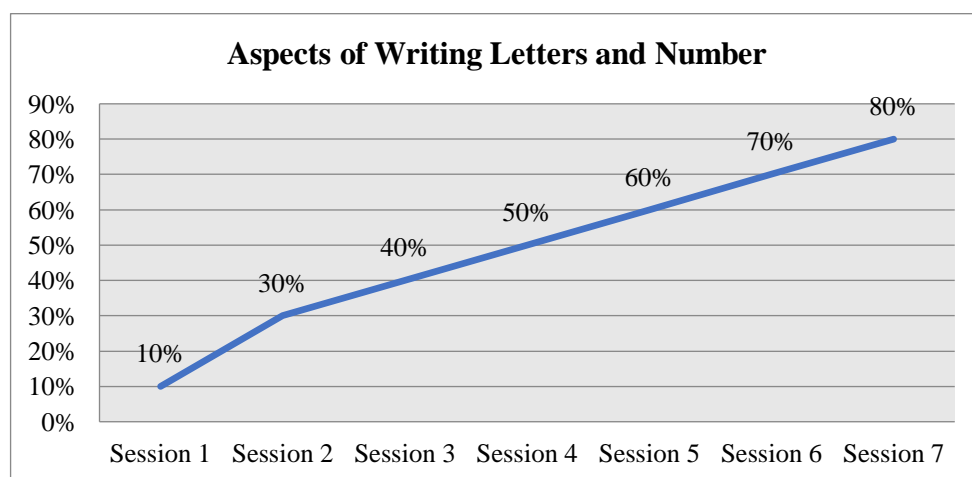
Looking at the results of line graph 4.2, it can be seen that APS has increased in distinguishing letters from the first session to the seventh session. In the first session with a percentage of 10%, APS just learned to recognize letters [b] and [d], letters [b] and [p], letters [y] and letters [m] and [n]. However, after being given treatment, in the second session with a percentage of 15% he began to recognize the letters [b] and [d], but could not recognize the letters [b] and [p], the letters [y], and the letters [m] and [n]. In the third session with a percentage of 20%, APS began to be able to distinguish the shapes of the letters [b] and [p], and had a little memory of the differences between the letters [b] and [d]. In the fourth session with a percentage of 30%, APS was able to remember the shapes and sounds of the letters [b] and [p], as well as the letters [b] and [d] and began to recognize the letter [y].

In the fifth session with a percentage of 40%, APS began to recognize the shape of the letters [m] and [n] and was able to remember the shape of the letter [y]. In the sixth session with a percentage of 50%, APS began to be able to recognize the sounds and shapes of the letters [m] and [n] as well as the letter [y], but APS could not remember well and still often confused the letters [m] and [n]. In the seventh session with a percentage of 60%, APS was able to distinguish the shapes and sounds of the letters [b] and [d], [b] and [p], and the letter [y]. However, they still cannot distinguish the sound and shape of the letters [m] and [n].

Based on graph 4.1, it is known that the second aspect is the aspect of writing letters and numbers. This aspect begins with a percentage of 10% before the treatment, but after it is done treatment increased by up to 80%. Changes in aspects of writing letters and numbers from session to session can be seen from the following line graph 4.3.

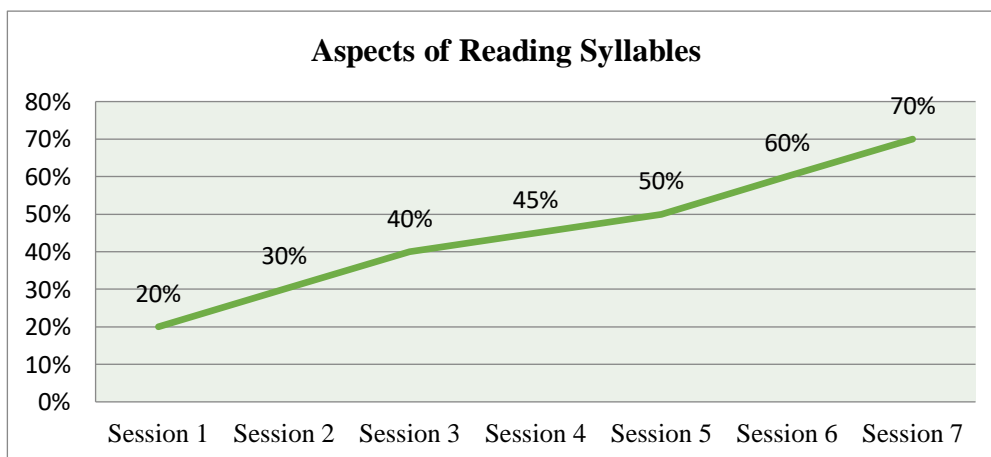
According to the result of line chart 4.3, it can be seen that APS has increased from the first session to the seventh session. In the first session with a percentage of 10%, the researcher taught him to write the letter a, but he still couldn't follow it well. Judging from the writing of

the numbers, there are still many that are reversed, including the number 7 and number 9 which are like the letter [e]. The numbers 2 and 3 are reversed. The letter [a] is still reversed between the letter [a] and the letter [q], and the letter [R] is reversed. Then the second session with a percentage of 30%, the letter [a] began to be able to write the letter [a] correctly but had to be demonstrated first, but APS no longer wrote with the letter [q], besides that he was able to write the number 7 with Correct. In the third session with a percentage of 40%, APS could write the letter [a] correctly, the number 7 correctly, and the number 9 correctly. In the fourth session with a percentage of 50%, APS could write numbers 2 and 3 correctly. In the fifth session with a percentage of 60%, APS was able to write the letter [R] correctly and write the numbers 1-10 in sequence correctly without turning it upside down. In the sixth session with a percentage of 70%, when arranging words through flashcards, he was able to write the words in a book without writing them upside down. In the seventh session with a percentage of 80%, APS was able to write the sentences dictated by the researcher on the blackboard correctly but needed to be repeated several times during dictation for the process of remembering the letters.



Graph 4. 3 Aspects of Writing Letters and Numbers

In addition to the aspect of distinguishing letters and writing letters and numbers, in graph 4.1 the third aspect is the aspect of reading syllables. This aspect starts with a percentage of 20% and reaches an increase of up to 70% in the seventh session. The improvement in the syllable reading aspect from session to session can be seen in the following line graph:



Graph 4. 4 Aspects of Reading Syllables

According to the results of line graph 4.4, it can be concluded that the aspect of reading syllables carried out by APS has increased. In the first session with a percentage of 20%, the researchers arranged the words [what], [api], [book], [read], [chilli], and [cherry] using flashcards, then taught APS to spell these syllables, APS could also follow it even though it must be given the first letter keyword first. In the second session with a percentage of 30%, researchers let APS read without being given keywords. He began to spell it himself. In the third session with a percentage of 40%, the researcher ordered APS to arrange flashcards and form them into a word. Words formed by APS include [game], [mega], [read], [can] and [stale]. APS can even spell it out on its own although some are still wrong. In the fourth session with a percentage of 45%, the researcher wrote down some words written in the APS book, APS could read them correctly and fluently for two syllables. In the fifth session with a percentage of 50%, the researcher taught to spell three syllables and words ending in a consonant, APS could follow but it was still a little difficult to combine sounds like the word [where] it could, but if it ended with a consonant like the word [write ], [which], and so on he is still a little difficult. In the sixth session with a percentage of 60%, APS could read words that were previously difficult and could not be followed from the initial session on the 'Learn Letters' application, namely the words [apple], [cup], [leaf], [shark], [iguana], [orange], [frog], [fly] and [shoe]. In the seventh session with a percentage of 70%, APS was able to read his own writing according to what the researcher dictated without spelling it even though it had to be repeated several times. And he began to be able to string words together into sentences but still needed the guidance of researchers.

Based on these graphs, the researcher concludes that in general the development of APS after the actions taken by the researchers during the seven meeting sessions had satisfactory results even though it had not yet reached the expected target. The developments experienced by APS include APS being able to recognize all letters correctly except the letters [m] and [n] which are still confused, APS is able to distinguish the letters [b] and [d], [b] and [p], then write the letters correctly, and write the numbers 1-10 correctly. In addition to recognizing, distinguishing, and writing, APS can also spell and read a syllable, two syllables, or three syllables. His cognitive development in using flashcards and the 'Learning Letters' application has increased. Finally, APS can also read without spelling even though it takes several repetitions.

## 2. Discussion

Dyslexia is understood as a disorder experienced in neurobiological processes that are directly related to reading activities (Fakhruddiana et al., 2017). The disturbance in the neurobiological process was discovered when conducting an interview with the APS mother who said, "He was born prematurely". This condition shows that one of the causes of APS experiencing dyslexia is due to birth factors. Generally, boys suffer from dyslexia because it is related to hormonal development while still in the womb (Pratama & Mukarromah, 2022). Reading difficulties can be caused by biological factors, namely a family history of dyslexia, premature pregnancy, and relevant health problems (Fransiska & Astuti, 2021). However, it is undeniable that these congenital causes can be treated early. This study examines the relationship between the effectiveness of flashcard creative learning media and the 'Learning Letters' application on the development of reading skills for dyslexic children. The purpose of

this study was to analyze the effectiveness of flashcard creative learning media and the 'Learning Letters' application on the development of reading skills for dyslexic children in an effort to deal with reading difficulties.

In this case, the researchers used flashcard media and the 'Learn Letters' application on smartphones. But the difference is that the learning activities in applying this flashcard media are by sorting the letters of the alphabet from A to Z, then arranging words from the flashcard as instructed, compiling their own words with two syllables without help, and reading what he has compiled using flashcards. Based on previous research, the flashcard playing method was considered effective for improving students' initial reading skills. Learning to read is divided into two, namely preliminary reading for 1st and 2nd graders and advanced reading for 3rd graders onwards (Rahma & Dafit, 2021). By reading the beginning, the child's cognitive process is actually running to understand the meaning of what is written. Beginning reading is done by recognizing letters, simple spelling and sounding symbols of language sounds (Mabunga et al., 2019). The initial process of beginning reading is by recognizing the shape of the letters A-Z and their pronunciation, spelling syllables, then reading words, and reading short sentences (Pratiwi & Ariawan, 2017).

As for the 'Learning Letters' application, this is a new thing for the world of learning media methods. The 'Learning letters' application the researcher uses is as a complement to the flashcard media. If your child is bored with using flashcards, then the 'Learn Letters' application is the solution. Children also enjoy using the 'Learning Letters' application because of the attractive, fun, and easy-to-use design. Based on the predecessor literature, the 'Learning Letters' application is almost similar to the Marbel application which aims to build children's knowledge about learning letters, learning numbers, learning to write and

reading (Karaman et al., 2018). Based on previous research (Hasanudin & Puspita, 2017) using applications in an effort to improve early reading skills, namely using the smart Bamboomedia BMGames Apps application media is believed to be able to create children's interest in learning and help children in early reading. According to previous research researched by (Kharisma et al., 2019) revealed that early reading learning that utilizes games on android applications is suitable to be applied by elementary school children, and can improve early reading skills for students, especially grade 1 students. used for the learning environment is able to encourage the learning process between students and teachers (Astuti et al., 2020). Referring to the results of previous research researched by (Widyowati et al., 2020) it is stated that application-based reading and spelling learning media is designed for students who cannot read correctly and fluently.

Through this application, children are required to be able to take advantage of digital technology in terms of reading. Therefore, the use of learning applications is very suitable to be applied in accompanying children's reading learning.

Flashcard media and the 'Learning Letters' application media are considered to have an influence in causing changes in APS reading. The following explains the causes of APS changes in reading:

- a. There is repetition in every process of memorizing and reading.

Through the process of repetition means that there is a process, method, or action that is repeated (Susanto, 2017). In this case, the researcher emphasizes APS to always repeat the

words he reads if they are not really fluent. In the process of memorizing letters, the researcher emphasized APS to repeat the letters he had memorized from the beginning. For example, if he memorizes the letter [d], then APS must recite the letters of the alphabet from the letter [a] to the letter [d], as well as when the APS memorizes the letter [y], then the APS must recite the letters of the alphabet from the letter [a] until it meets the letter [y]. With repetition like that, APS can memorize the letters at the beginning that he had previously memorized, even if he forgot in the middle he could repeat again to remember the letters even more. In every reading process, APS also becomes accustomed to repeating the words he reads if he makes mistakes in reading. Repetition is done with the aim of correcting the wrong readings that have been read. The repetition of the beginning of a syllable, then into two words, and three words to become a sentence. For example in the sentence "I like reading books", because researchers get used to APS to repeat what they have read, so that when tested APS reads as follows.

A ku becomes aku

Su ka becomes suka, aku suka.

Ba ca becomes baca, aku suka baca.

Bu ku becomes buku, aku suka baca buku.

In the end he was able to read a sentence in its entirety because of the repetition of words that helped him construct a correct sentence.

- b. There is enthusiasm and motivation to be better.

Learning motivation is an impulse that creates a high enthusiasm for learning and passion in the learning process to achieve certain goals (Arianti, 2018). Children's learning motivation is likened to a door of teaching and teacher education to children (Fitri, 2020). In this case, APS has the passion and motivation to be able to read so he tries hard to make progress every day in his learning process. On the other hand, his father's jokes that often underestimated him made APS even more enthusiastic to prove that he too could read fluently one day and would show it in front of his father.

- c. There is appreciation and pleasure in learning.

Appreciation is a form of appreciation for the results of a child's hard work or effort in doing something. The benefits of appreciation are to increase children's confidence in their efforts, increase children's motivation to make maximum efforts, and of course to make children happy after doing something they do. In this case, researchers often appreciate APS when APS succeeds in doing something. For example, when APS has succeeded in distinguishing the letters [b] and [d], at that time the researchers really appreciated the success of APS. APS felt so happy and proud that he showed it in front of his parents by reading some words that started with the letters [b] and [d]. He managed to read fluently even while spelling but he no longer confused the letters [b] and [d] in a word. It causes him to be happy in learning and it is a good change in supporting the development of reading.

The research findings show that the application of the flashcard creative learning media method and the 'Learning Letters' application is effective in improving children's reading skills, especially in dyslexic children. This is evident from the results of the development of learning to read APS in table 4.1 and graphs 4.1, 4.2, 4.3, and 4.4, namely the progress from session to session although not so fast. For example, to be able to distinguish the letters [b] and [d], in the

APS study it took 2 sessions, so that in the third session the APS was able to distinguish the letters [b] and [d]. In addition, to be able to read a sentence correctly without spelling it takes 6 sessions, so in the seventh session APS was able to read a sentence correctly without being spelled even though he had to read it over and over again in order to be able to read correctly in one sentence.

In addition to the causes of changes in APS reading skills, it is known that there is a reason that there has not been a change in APS reading, namely that they have not experienced continuity within a certain period of time. Learning to read for dyslexic children requires continuity in teaching it. Dyslexic children are not able to immediately master all the letters in one meeting. Dyslexic children also have limitations in listening and absorbing what they get. Of course, in this case, dyslexic children should not be forced to study consecutively. Because learning is done successively every day, it can make children become bored (Fakhruddiana et al., 2017). Obtaining good results for the process of learning to read for dyslexic children is three times a week. And for the length of study time, the ideal is 20 minutes. In this case, the researchers conducted research on the level of development of reading APS during 7 meeting sessions. Researchers carry out for 3 to 4 times a week. It meaning that the researcher used two weeks to examine the development of APS reading using flashcard media and the 'Learning Letters' application. APS sensitivity to letters and letter sounds is considered better after using the 'Learn Letters' application feature because according to (Fakhruddiana et al., 2017) children can get used to being able to understand after several meetings, and their memories are embedded about the letters and sounds of the letters. . However, of course, the results of the research that the researcher made cannot be separated from the mistakes of the researchers caused by the limitations of the researcher.

#### **D. Conclusion and Recommendation**

This qualitative research type of case study shows that the flashcard learning media method and the 'Learning Letters' application can improve the early reading ability of dyslexic children by showing that the reading ability experienced by APS increases. The results showed that the ability to read for children with dyslexia, namely APS, had increased. This means that the use of flashcard learning media methods and the 'Learning Letters' application is effective for improving early reading skills for dyslexic children. These media and applications can also make children feel comfortable and enthusiastic in learning and feel happy because students feel they can play while learning and exploring their knowledge. If the flashcard learning media and the 'Learning Letters' application are used in the same case, it is hoped that the teacher will be able to present more interesting media by utilizing digital technology that is tailored to students' interests. If other researchers want to use the same method, it is hoped that they can dig up information and data from homeroom teachers who are more aware of students' daily learning activities so that learning ability data can be obtained more comprehensively.

#### **E. Acknowledgment**

The researcher expresses his gratitude for the guidance and direction from Dr. Idat Muqodas, M.Pd. as the instructor of the Inclusive Education course and Deputy Director and Aan Yuliyanto, M.Pd as the instructor of the Inclusive Education course as well as the PGSD




STKIP lecturer Prince Dharma Kusuma Indramayu who has guided the research process and article writing. Second for Prof. Sofyan Iskandar, M.Pd as the academic supervisor who always guides the writing of this article. Furthermore, thanks are conveyed to Dr. Hafiziani Eka Putri, M.Pd. as Head of the Elementary School Teacher Education Study Program, UPI Campus in Purwakarta who has facilitated researchers in researching and publishing this article.

## F. References

- Arianti. (2018). Peranan Guru Dalam Meningkatkan Motivasi Belajar Siswa. *Didaktika Jurnal Kependidikan*, 12(2), 117–134.
- Astuti, I. P., Ariyadi, D., & Sumaryanti, L. (2020). Prototipe Media Pembelajaran Berbasis Android Untuk Membaca Permulaan. *Jurnal SIMETRIS*, 11(1), 151–156. doi: <https://doi.org/10.24176/simet.v11i1.3791>
- Cidrim, L., Braga, P. H. M., & Madeiro, F. (2018). Desembaralhando : a mobile application for intervention in the problem of dyslexic children mirror writing. *REVISTA CEFAC: Speech, Language, Hearing Sciences and Education Journal*, 20(1), 13–20. <https://doi.org/10.1590/1982-0216201820111917>
- Fakhruddiana, F., Ekawati, D., & Kinayung, D. (2017). Metode Fonemik Motorik Untuk Meningkatkan Kemampuan Membaca Penyandang Disleksia. *JPK: Jurnal Pendidikan Khusus*, 13(2). <https://doi.org/10.1590/1678-7757-2017-0414>
- Fernanda, E., Lara, F. L., & Umana, A. G. (2017). El Juego Como Estrategia Ludica Para La Education Inclusiva Del Buen Vivir The Game As A Fun Strategy For The Inclusive Education Of Good Living. *ENSAYOS, Revista de La Facultad de Educación de Albacete*, 32(1), 81–92.
- Fitri, M. (2020). Pengaruh Emergency Remote Learning Untuk Melihat Motivasi Belajar Anak Usia Dini. *Child Education Journal*, 2(2), 68–82.
- Fitriani, H., Imanda, R., Rahmi, A., & Nurmalinda, S. (2021). The development of flashcard learning media based on make a match on colloid. *International Journal for Educational and Vocational Studies*, 3(5), 373–379. <https://doi.org/10.29103/ijevs.v3i5.6069>
- Fransiska, & Astuti, A. W. (2021). Kesulitan Belajar Membaca (Dyslexia) Pada Siswa Kelas III (Studi Kasus di Sekolah Dasar Negeri 10 Miau Merah). *Wahana Sekolah Dasar*, 29(1), 27–36.
- Hasanudin, C., & Puspita, L. (2017). Peningkatan Motivasi Dan Keterampilan Membaca Permulaan Siswa Kelas I Melalui Media Aplikasi Bamboomedia Bmgames Apps. *PEDAGOGIA : Jurnal Pendidikan*, 6(1), 1–13. <http://dx.doi.org/10.21070/pedagogia.v6i1.618>
- Ika, I., Mimanah, A., & Suprpto, N. (2020). Development of an Inquiry-Based Science Learning Material Using Flash Card to Reduce Misconception of Elementary School Students. *IJORER : International Journal of Recent Educational Education*, 1(2), 178–190. <https://doi.org/10.29103/ijevs.v3i5.6069>
- Karaman, J., Setyanto, A., & Sofyan, A. F. (2018). Analisis Aplikasi Marbel Huruf Versi Mobile Terhadap Pembelajaran Membaca di Desa Semanding Ponorogo. *INTENSIF: Jurnal Ilmiah Penelitian Dan Penerapan Teknologi Sistem Informasi*, 2(2), 98–106.
- Kharisma, G. I., Arvianto, F., Pendidikan, F. I., Timor, U., Pendidikan, F. I., & Timor, U. (2019). Pengembangan aplikasi android berbentuk education games berbasis budaya lokal untuk keterampilan membaca permulaan bagi siswa kelas 1 SD/MI. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 9(2), 203–213. <https://doi.org/10.25273/pe.v9i2.5234>
- Knight, C. (2018). What is dyslexia? An exploration of the relationship between teachers ' understandings of dyslexia and their training experiences. *Dyslexia*, 24(June), 207–219. <https://doi.org/10.1002/dys.1593>

- Loflin, L., Vargo, K. K., & Plaster, M. (2020). Read: On Online Journal for Literacy Educators 2020. *Journal for Literacy Educators*, 5(Vol 5 No. 8), 1–28.
- Mabunga, A. S., Mabunga, M. E. M., & Yani, A. (2019). Kesulitan Membaca Permulaan pada Anak Usia Dini dalam Perspektif Analisis Reading Readiness Contents. *Mimbar Pendidikan Jurnal Indonesia Untuk Kajian Pendidikan*, 4(2), 113–126.
- Metafisika, K. (2019). Penilaian Keterampilan Bertanya Calon Guru PAUD sebagai Strategi Pengembangan Kognitif Anak Usia Dini. *Child Education Journal*, 1(2), 88–95.
- Pratama, R. Y., & Mukarromah, I. (2022). Analisis Gangguan Bahasa Pada Anak Melalui Kajian Psikolinguistik. *FASHOHAH: Jurnal Ilmiah Pendidikan Bahasa Arab*, 2(1), 40–48. <http://riset.unisma.ac.id/index.php/fashoh>
- Pratiwi, I. M., & Ariawan, V. A. N. (2017). Analisis kesulitan siswa dalam membaca permulaan di kelas satu sekolah dasar. *Sekolah Dasar Kajian Teori Dan Praktik Pendidikan*, 26(1).
- Rahma, M., & Dafit, F. (2021). Analisis Kesulitan Membaca Permulaan Siswa Kelas 1 Sekolah Dasar. *Qalamuna - Jurnal Pendidikan, Sosial, Dan Agama*, 13(2), 397–410. <https://doi.org/10.37680/qalamuna.v13i2.979>
- Roshaidai, S., & Arifin, M. (2018). Ethical Considerations in Qualitative Study. *International Journal of Care Scholars*, 1(2).
- Snowling, M. J., Hulme, C., & Nation, K. (2020). Defining and understanding dyslexia: past, present and future. *Oxford Review of Education*, 46(4), 501–513. <https://doi.org/10.1080/03054985.2020.1765756>
- Susanto, A. (2017). Proses Habitiasi Nilai Disiplin Pada Anak Usia Dini Dalam Kerangka Pembentukan Karakter Bangsa. *Sosio Religi: Jurnal Kajian Pendidikan*, 15(1), 18–34.
- Vasconcellos, S. R. De. (2018). Relationship between phonological working memory , metacognitive skills and reading comprehension in children with learning disabilities Abstract. *JAOS: Journal of Applied Oral Science*, 1–8. <https://doi.org/10.1590/1678-7757-2017-0414>
- Wen, J. M., Do, H. D., Liu, E. Z. F., Lin, C. H., & Huang, S. K. (2020). Educational board game and flashcard: Which one is better for learners at beginner level of Chinese language? *International Journal of Serious Games*, 7(4), 89–104. <https://doi.org/10.17083/ijsg.v7i4.347>
- Widyowati, F. T., Rahmawati, I., & Priyanto, W. (2020). Pengembangan Media Pembelajaran Membaca Berbasis Aplikasi untuk Kelas 1 Sekolah Dasar. *International Journal of Community Service Learning*, 4(4), 332–337. doi: <http://dx.doi.org/10.23887/ijcsl.v4i4>
- Yedra, R. J. Y., & Aguilar, M. A. A. (2022). Design Thinking : Methodological Strategy for the Creation of a Playful Application for Children with Dyslexia. *Journal Informatics*, 9(Vol. 9 No. 1). <https://doi.org/10.3390/informatics9010001>

## E. Author's Biography

**Syifa Mutiara Puradireja** adalah seorang mahasiswa di Universitas Pendidikan Indonesia, Indonesia. Dia adalah mahasiswa dari jurusan Pendidikan Guru Sekolah Dasar. Ada juga data identifikasi akademik sebagai berikut ORCID:  <https://orcid.org/0000-0001-7790-9931>