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VISUAL AUDITORY KINESTHETIC MODEL DEVELOPMENT (VAK) BASED ON INTERACTIVE MEDIA IN ELEMENTARY SCHOOLS

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ABSTRACT
Learning difficulties onditions characterised by obstacles in the activity of achieving a goal, so it requires more effort to overcome them. Reading difficulties are part of the learning difficulties in the academic achievement problem group. Dyslexia in general is a learning disorder in children characterized by difficulties in reading and writing. The DSM notes that the term refers to a pattern of learning difficulties characterized by problems with accurate or fluent reading, poor decoding, and poor spelling, as well as observation for at least six months of emerging learning difficulties in students. The fact that cause of dyslexia is a disturbance in the brain. Based on the results of observations and interviews in grade 3 of SD Cilubang 01 Bogor Regency, there are students who experience dyslexia. One solution is to apply visual, auditory, and kinesthetic (VAK) models based on interactive multimedia. The visual, auditory, and kinesthetic model (VAK) is a learning model that involves the senses to optimize learning. In learning, treatment is carried out for students with the initials "D" by applying the VAK model and using various applications for interactive learning to read. The aim of this research is to describe the development of an Auditory, Visual Kinesthetic (VAK) model based on interactive media. The research method used is a case study, collecting data by observation, interviews, and tests. The results showed that there was an increase in the learning outcomes of students who scored "D" in reading even though they were not very fluent or stammered. It can be concluded that the development of interactive media-based models can improve the reading skills of dyslexic students in elementary schools.

Keywords: *visual auditory kinesthetic, dyslexia, elementary school,*

1. INTRODUCTION
At this time where learning is in the 5.0 era of society. It requires the role of all parties in learning, especially in order to improve the potential of students according to visual, auditory, and kinesthetic learning methods, and also requires the ability of teachers to use interactive multimedia related to information technology. Almost all aspects of life today depend on the use of information technology, which is why skills that lead to the realization of increased interactive learning through multimedia are needed.

The definition of interactive multimedia put forward by Hofstetter Munir (2015)is that interactive multimedia is a computer with a mixture of text, graphics, sound, and animation accompanied by links and tools. In line with this understanding, the definition of interactive multimedia was put forward by Munir (2015), that is, multimedia with a user-operable console so that the user can choose for himself what he wants for the next operation. Some examples of interactive multimedia include interactive educational multimedia, game applications, and etc.

The use of interactive multimedia will create a sense of curiosity in the students to learn. The use of different apps in learning creates a sense of fun for the students and immense curiosity with the new apps that are very interesting for the students and easy to access.

Based on the results of observations and interviews with 3rd-grade teachers at SDN Cilubang 01, Bogor Regency, researchers have found unique and interesting things related to the learning difficulties of dyslexic students. The student has the initials "D". At the time of the observation in class, the subject was still having difficulty learning to read, starting with not understanding letters. The subject still needs guidance from the class teacher. According to the interviewed class teacher, he explained that D's communication with the class teacher was very good, and the class teacher also said that D was very good at drawing, painting, mathematics, and sports. Can learn the subjects well. In addition, the subject is able to respond to speech when communicating with teachers, parents, and friends. The attitude of good friends to the subject and vice versa. Substantive cooperation with his friends was very good. "D" is very active in class compared to the other students. In the guild in class "D", the class teacher also revealed that "D" had friends who were very close to him at school. So, it can be concluded that learning in the classroom is very good.

Moats, L. C., & Farrell (1999 ; Handbook, 2014) Dyslexia is a difficulty in the learning process experienced by a person, especially in reading, writing, and spelling words. Reading is a very important skill that everyone needs. Reading is expected to open a window to the world so that everyone can see all the changes that are happening in this world. By reading it is expected that everyone can add to their knowledge. Reading is an important skill and is also at the heart of formal education. A student who does not have the ability to read will have difficulty learning and mastering other sciences, as a result of not developing well at school or in life as expected.

Based on the results of interviews with parents that "D" is a very good student, not lazy and quite firm, D's speech is soft, and he never complains, even if he is very spoiled to his parents, if D is very close to his mother, but outside the home, D is very close to mother. D's mother did not forget to mention that her student D was very resolute and brave, so she rarely received ridicule from her

peers, but she was very close to them. So ,we can conclude that D is very cheerful and loves hanging out with his peers. D is very happy if there are games shown on mobile phones or computers only because of restrictions on their ability to read so they rely more on their hearing or hearing aids to learn.

Based on the results of observations and interviews, it is shown that there are problems with the ability to read the letter "D" caused by dyslexia, and these problems need to be resolved so that participants with dyslexia can get appropriate treatment so that they can improve their reading skills. Apart from that, in providing assistance to dyslexic participants so that learning is more interactive, a fun that teachers and parents can do is to apply the Visual, Auditory, and Kinesthetic (VAK) model.

2. LITERATURE REVIEW

2.1 Visual, auditory, and kinesthetic (VAK) models

The visual, auditory, and kinesthetic (VAK) model is a learning model that involves the senses to optimize learning. Involvement of all sensory organs in learning such as 1) eyes to see, observe, read, and exa,min, 2) ears to listen to store various sounds, resonances and verbal harmonization received as part of the auditory, 3) skin, hands, feet, and limbs of the other body physically become part of the kinesthetic (Rukmana et al., 2018). The application of the VAK learning model is one of the efforts made by the teacher to accommodate the various learning styles of students, namely visual, audio, and kinesthetic (Arsyad, 2019)

The application of the VAK model will be more interesting and also motivate students' learning by assisting or based on interactive learning media. Because in addition to the media being easier to access, it can also increase students' abilities in utilizing digital technology media.

A visual learning model. Auditory, kinesthetic (VAK) according to Suryani Simbolon et al/ (2018), is one of the quantitative learning models, assuming that in learning each student has his own learning style, some tend to be visual, auditory, or kinesthetic. Participation differences in a combination of the three are combined through a quantitative learning paradigm with the perception-auditory-motor type (VAK). The VAK model according to Deporter Bobbi,(2008) in Suryani Simbolon et al. (2018) is a paradigm that models visual learning by showing more eye-observable visual images such as two-dimensional images, still images, projected images, or even videos. Pairs of phonological learning styles find more learning styles in how they communicate verbally or in the form of sounds, which, with the capacity of the auditory senses, can be received, digested, and stored in the memory of the brain very easily. The kinesthetic learning style is more synonymous with always being moving, and it does not want to remain static because it works on the various senses and motors in the learning process. By including these three learning styles, it is hoped that the application of the VAK model will improve the capabilities that exist within each learner (Pratama et al., 2017)

With regard to the presentation of perception-auditory kinesthetic learning (VAK), according to Huda (2014)in Ayu et al. (2018) that: the visual, through visuals, demonstrates the memory of different colors, images, and display shapes making it easier to store them in the brain's memory in the form of coding. A visual learner has the following characteristics - he supervises and observes everything he sees; He remembers - through - pictures, he prefers to be read rather than read aloud and requires a general framework and purpose to capture or remember visual details; Audiology: - Through hearing aids encoding various sounds, phonology, music, and sounds. In this hearing, he will quickly remember and pick up on whether you can hear him clearly even though you are not paying clear attention. Auditory learners have these characteristics: their attention is often unfocused; - talk to the beat, learn more by hearing; and dialogue - at home and abroad; Mobility: - Through the moving motor. This kinesthetic learning style will find meaning if the kinesthetic senses are felt, touched, moved, and the movements are repeated. In this kinesthesia - all kinds of movement - and - = feelings - are created or remembered, such as - movement, coordination, rhythm, emotional response, - and physical well-being. - A student prone to kinesthetics has the following characteristics of learning: touching people, standing close, and moving a lot; learning while doing, - writing wisely while reading, responding - physically; And -remember-while-walking-and-watch Umayah et al., (2017)

The definition of the visual, auditory, and kinesthetic (VAK) model according to experts includes:

1. According to Rusmiyati (2022) VAK learning paradigms are paradigms in teaching and learning activities that are based on sight, observation, study, and hearing for auditory and motor movements of kinesthetic. The central point of the VAK model is the experience that students direcly have through the optimization of the three learning styles.
2. According to Parbawa (2018) the VAK model is a more effective model that prioritizes learning styles, i.e. visual, auditory, and kinesthetic. Teaching and learning activities are improved the capabilities of the participants related to the learning style that distinguishes each individual through training and development. A model that directs students' freedom to learn through the assumptions they have for better learning.
3. According to Suryani Simbolon et al. (2018)visual, auditory, and kinesthetic models are models that improve the three learning styles. Paradigm - visual, auditory, and kinesthetic are quantum-based learning paradigms that have first-hand experience principles that provide comfort.
4. According to Pratama et al. (2017)), the VAK learning model is a model that prioritizes exclusive and enjoyable learning experiences for students. Direct learning takes place through seeing (visual) and hearing - (auditory) and learning to use movement and emotion (kinesthetic)
5. According to Kusumawati. et al. (2018) the VAK model is a model that explains instrumental learning when paying attention to learning styles, i.e. visual, auditory, and kinesthetic. The -VAK model improves the potential of students who have been trained and developed.

2.2 Visual auditory kinesthetic model steps

a. Visual learning-model syntax or steps. Aditori, and Kinesteik (VAK) are:

1. Initial activities
2. Submission of learning objectives that optimize 3 ways of learning students
3. Implementation of active learning
4. The stage of the appearance of the results of learning activities is the presentation of the results of the implementation of learning

Learning with the application of the VAK model can be designed in three stages, namely:

2. Visual stage, students learn through the sense of sight. Students observe pictures or other props displayed by the teacher in order to clarify material objects that have been manipulated using learning media
3. Auditory stage, students learn through the sense of hearing. Students listen to the presentation from the teacher and study well. This auditory is not only conveyed by the teacher but is able to share information with other students in discussion groups that have been grouped by the teacher.
4. In The kinesthetic stage, students learn through physical motor activity and direct involvement. With physical motor involvement in deepening the material either hands, feet, or mind, students learn actively, under the direction of the teacher.

The weakness of the VAK learning model is that not many teachers apply this VAK model, there are still many who find it difficult to integrate the three learning styles in learning so this model is considered troublesome. Not many people are able to combine several learning styles into one learning, usually, they are only able to capture the material if they use a method that focuses more on one of the dominant learning styles.(Ayu et al., 2018)

2.3 Dyslexia

Results of the problem in this study, using research on dyslexic children in grade 3 at Cilubang 01 Government Primary School, Bogor Regency, it was found that dyslexic people had severe difficulties in reading and writing but could interact well with other normal children.

Students.have difficulties with reading, let alone reading, and even knowing the letters and spelling them proved difficult at first Often upside down when pronouncing letters, difficulty concentrating, and difficulty determining position and direction from left to right. Based on the characteristics and information obtained by the researchers from the results of observations and interviews, the subject can be referred to as a dyslexic student. This finding is in line with Dewi (2020) view that dyslexia means a condition of learning difficulties in a person due to difficulties in carrying out reading and writing activities.

In addition, this subject also found it difficult to recognize letters and spelling, often felt wrong about letters, often inverted letters were almost the same, had difficulty identifying left and right directions, and also found it difficult to concentrate on learning. This is also in line with the characteristics of dyslexia as stated by BM & Damanhuri (2016) the characteristics of dyslexia are characterized by language disorders that include: an a) verbal language that includes limited vocabulary, non-verbalization, mispronunciation, distorted perception, storytelling that is not coherent, of Complex and rhythmic instructions are difficult to follow, easy to forget, b) Written language involves difficulty distinguishing phonemes (including shapes, names, letters, and numbers) Writing is out of sync rules, missing the alphabet or words. Difficulty arranging words into sentences, Difficulty using conjunctions, c) Social language includes difficulties understanding situations and body language versus speech, Difficulty figuring out words that have no form, Sounds rude because they don't "follow" social customs, and is too standard and strict for grammar Understandable, the difficulty of distinguishing between right and left.

The stages and efforts made by the student's parents and teachers were as follows:

The teacher asks the students to note which letters are arranged using letter cards made from pieces of (visual) cardboard. After the observation, the teacher names the letters while asking the child to repeat the mention of the letters (phonetic).Next, the teacher mixes up the letters that were previously a whole word.The students are asked to rearrange the letters into a word as before (kinetic and tactile).For evaluation, the teacher usually asks the students to rewrite the words that have been formed.

Based on the above steps and efforts, it is in line According to Loeziana (2017) for children with dyslexia, the type of intervention most effective in increasing literacy skills is the intervention most effective in increasing phonology. Abilities: This overlap is usually considered acoustics. People with dyslexia will be taught basic elements such as: a) learning to recognize phonemes or the smallest sound unit in words, b) understanding letters, and c) ordering the letters that make those sounds, understanding what is being read, reading aloud, and building vocabulary.

The point is dyslexia is treatable. Therapy aims to train children to behave normally in society. One solution to help students with dyslexia to be able to learn quickly is to apply the visual learning model. Auditory, kinesthetic (VAK) with the help of interactive media learning to read https://youtu.be/2TPfreILEVQ

2.4 Interactive multimedia

Interactive multimedia used in learning is an excellent medium for enhancing the learning process by providing opportunities for students to develop skills, identify problems, organize, analyze, evaluate, and communicate information (Wiyono et al., 2012) According to (Rusman, 2011 ; Wiyono et al., 2012) an interactive multimedia system must meet the following criteria: (1) oriented to learning objectives, (2) oriented to individual learning, (3) oriented to independent learning and (4) oriented to complete learning. While the current interactive multimedia system generally provides the same presentation of learning material for each user because it assumes that the characteristics of all users are homogeneous. In fact, each user has different characteristics in terms of ability level, learning style, background, or others. Therefore an interactive multimedia user does not necessarily get the right learning material and as a result, the learning effect is not optimal. An interactive

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multimedia system should be able to provide learning materials whose level of difficulty is in accordance with the user's ability, and how to present the learning material in accordance with the user's learning style. In other words, an interactive multimedia system should be able to adapt its appearance to a variety of user characteristics, so that it has high learning effectiveness. Adaptive interactive multimedia in question is interactive multimedia which consists of presentations in the form of text, audio, graphics, and animation that are able to adapt to the different learning styles of students taking introductory solid-state physics courses so that they learn in a pleasant environment. There are many definitions of learning styles. According to James (1993) in Wiyono et al. (2012), learning style is defined as learning habits in which a person feels the most efficient and effective in receiving, processing, storing, and issuing something learned.

Interactive multimedia is a combination of several media that are designed in one whole such as images, text, audio, animation, and simulations used in learning to clarify material or abstract concepts into concrete, equipped with tools. Learning multimedia consists of several models that can be applied therein. Heinich, et al in Munir (2015) suggest that learning models using multimedia can be in the form of practice and training models, tutorials, games, simulations, discoveries, and problem-solving.

In an effort to help "D" students, researchers, while applying the VAK model, also use various interactive applications, including:

1. Let's Learn to Read

https://play.google.com/store/apps/details?id=dyza.education.belajarmembaca

A game application for learning to read in Indonesian that dyslexic children can use is the Let's Learn to Read application. This application can help students learn to read and spell with voice guidance features.

2. Playing While Learning

A Game application for learning to read in Indonesian Play While Learning. (Doc. Playing While Learning). The learning-to-read game application is designed for children aged 2 to 7 years old who are learning to read while getting to know various objects but can be used to learn to read dyslexic students.

Not only that but this application is also equipped with various puzzle games that can help dyslexic students recognize letters more quickly. Apart from getting to know letters and objects, this application also has games to learn to read words with 1 to 3 syllables.

3. Learn to Read and Count

Game application for learning to read in Indonesian Learn to Read and Count. (Doc. Learning to Read and Count). If you want to use an application that can help you learn to read as well as do arithmetic, the Learning to Read and Count application is one of the choices. This application not only plays games to learn to read but also counts using the help of pictures.

4. Learn to Read Fluently

Game application for learning to read in Indonesian Learn to Read Fluently. (Doc. Learn to Read Fluently). One of the game applications for learning to read that can help children to read fluently is Learning to Read Fluently.

This application has complete content, such as:

recognize the letters A-Z.

recognize and read AIUEO vowels.

read one, two, and three syllables.

Recognize the affixes -range and -nya.

Recognize words that start and end with consonants. know the names of family members, animals, fruits, colors, and so on.

This application has play features such as guessing reading words, word balloons, guessing vowels, and word puzzles.

Playing is the world as well as a means of learning for children. Giving children the opportunity to play means giving them the opportunity to learn. Providing opportunities for children to learn in ways that can be categorized as playing means trying to make the learning experience felt and perceived naturally by the child concerned so that it becomes meaningful for him.

3. METHODS

3.1 Research method

The research was performed in category 3 of SDN Cilubang 01 Bogor Regency Province, West Java. Research time in the even semester of the academic year 2022-2023. The research method used is a research method with explanatory case studies, and case studies that focus on phenomena in the students' real lives (Creswell, 2012). Research refers to a single instrumental case study or single instrumental case study which is a form of case study research on dyslexic students which is conducted using a case to provide an overview of an issue or problem to be investigated by Tellis (1997)Case studies can be seen as fulfilling three principles of the qualitative method: describing how a dyslexic learner learns, understanding the characteristics and how to deal with them, and explaining the role of the teacher and parents/family in improving the reading ability of the dyslexic. student. The research subjects were students with the first letter "D", while the participants were third-grade teachers, students' parents, as well as studies documenting students' learning outcomes.

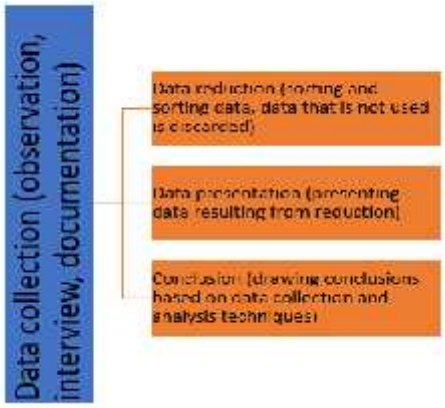

Figure 1. Design of data collection and analysis techniques for explanatory qualitative research using a case study approach

4. RESULTS & DISCUSSION

The Realities in the field of selective students tend to be more difficult to achieve the learning goals that have been set. It is not easy to identify the factors that cause learning diseases because these factors are complex. But learning for dyslexic students is different from other normal students. According to the interviewed class teacher, he explained that D's communication with persons teacher was very good in the class, and the teacher also said that D was very good at drawing, painting, mathematics, and sports.

The researchers conducted research at SDN Cilubang 01, Bogor Regency from May 26th to June 10th, 2022 in order for the innovation results obtained to be sustainable.

What the researchers concluded was this: Subjects can learn well. In addition, the subject is able to respond to speech when communicating with teachers, parents, and friends. The attitude of good friends to the subject and vice versa. Substantive cooperation with his friends was very good.

Ananda was very active when doing teaching and learning activities, you could say Dimas was one of the kids who was active in sports and he was good at maths, he was more responsive. The weaknesses that D still has is that it still lacks vocabulary and letters and still lacks Indonesian material, especially reading.

This is what the third-grade teacher said, explaining that "D" was very active in the class compared to other children. In the guild in class "D", the class teacher also revealed that "D" had friends who were very close to him at school. So it can be concluded that learning in the classroom is very good.

Parents are the people who accompany us every day, from going to bed and getting up and sleeping again, so parents play an important role or a very important figure in social interaction, and also parent "D", according to him "D" is a very good child, not lazy and firm Just like that, in an interview with her parents, her mother revealed "D" personally.

To overcome obstacles in reading so that dyslexic students can read quickly. Teachers need to take appropriate approaches and learning models so that students can learn effectively and efficiently. Based on the results of observations and interviews conducted with teachers, parents, and students that the learning method used by the teacher is to apply the multisensory method. With the multisensory method, students are expected to be able to activate and balance between visual, audio, kinesthetic, and also tactile. The multisensory model is often called the VAKT method. Where the use of this method is very important for children with special needs.

a. Visual (Sight)

Students "D" are invited to see, and observe objects and pictures, identify object names, and distinguish two or more objects through picture books, picture books with letters, letter cards, picture books with stories, and picture story books. Development of vocabulary, recognition of letters, words, and sentences, expressive and receptive language.

b. Auditory

To train the teacher's auditory to carry it out by conversing, and reading vowels and consonants through the media of letter cards, letter blocks, and letter puzzles, this stimulates students' auditory understanding of language and letters as well as phonological awareness.

c. Kinesthetic and Tactile

To train their motoric and kinesthetic students "D" are invited by the teacher to carry out activities such as folding, sticking, cutting, writing, feeling, drawing, looking for letters, sorting letters in letter puzzles, putting blocks of letters into boxes and arranging them to form a word. This activity is expected to train motor skills, creativity, communication, and interaction skills, and shape recognition for students "D"

Learning media for children with special needs is very important because learning media makes students with special needs motivated to learn. Learning media used in overcoming dyslexic students include using letter cards, letter blocks, and letter puzzle media or using learning-to-read applications in the form of applications that are in Google Play and can be easily downloaded. The use of learning to read applications on Google Play which according to today's children is more modern and more interested

Based on the results of observations and interviews with students and teachers, among others. To help student "D" the media used the first time to get to know letters by using letter cards because students "D" still did not know many letters, especially consonants while vowels can already be shown and written them. After a while, it turned out that using letters still didn't show anything significant. mention it, but there are still difficulties in writing it down, to help students write it easily and appropriately, on the basis of discussions with researchers, they try to use interactive learning media on Google Play. The reaction of students when using this medium was very enthusiastic and happy to learn to write letters and write them in word form.

Based on the results of interviews with teachers: Student "D" had difficulty in writing down his ideas. When given a text that is read, students can quickly capture the contents of the text and provide ideas, but when they are about to write down these ideas in written

form, students "D" cannot write them properly, because of their vocabulary skills and the ability to identify each word. the letters are still confusing for “D”. To be able to help students, I as a teacher usually dictate letter by letter each word what the ideas of these students are. To train their visuals, their hearing, and their kinesthetic and tactile training I will ask students "D" to write down the words dictated by me, this is intended so that "D" students are trained in multisensory.

As an effort to help "D" students, researchers always apply the VAK model and also use various interactive multimedia applications, including:

a. Visual

Students are asked to observe the writing and pictures in the reading learning application, pay attention to a letter by letter, word by word, and pay attention to the shape of the letters.

b. Auditory

Students listen to the pronunciation of letters, words, and sentences spoken by the teacher and the sounds in interactive multimedia applications.

c. Kinesthetic

Students are asked to repeat the writing that has been observed and rewrite the letters, words, or sentences that have been learned.

Tabel 1. Ability "D" 6 months ago (at the beginning of grade 3)

	Recognized/read/pronounced by “D”	**Which can't be recognized/read/pronounced by "D"**
Vowel	All vowels can	
Consonant letters	Not all letters memorized, even if asked still confused (don't know)	v,x,y,z
Diphthong letters(ny, ng, kh, sy….)	Not quite able to recognize yet	Ny, Ng
Double vowels (ai, au, oi …)	-	Can't read double vowels yet
Syllables	-	At first, "D" still had a lot of trouble being able to combine consonants and vowels into syllables, because he still couldn't recognize letters.
word	Just a few words and that's what "D" often sees and hears every day	Can't because the letters just can't be memorized them
Sentence	-	-

The table above shows the ability of students "D" before the reading treatment was carried out by applying the interactive media-based VAK model. The following table shows the results of improving reading skills after implementing the interactive media-based VAK model

Tabel 2. The next "D" capability (after receiving assistance for approximately 6 months

	Recognized/read/ pronounced by “D”	**Which can't be recognized/ "D"**
Vowel	**a,i,u,e,o**	-
Consonant letters	**A-Z already memorized**	-
Diphthong letters(ny, ng, kh, sy….)	**Can already pronounce it**	-
Double vowels (ai, au, oi …)	**Already starting to be able to remember and pronounce it**	-

Syllables	**Already able even though sometimes he spells**	**-**
word	**Already able even though sometimes he spells**	**-**
Sentence	**Before using the Visual, Auditory, Kinesthetic Model (VAK) Based on Interactive Multimedia, don't even read sentences, don't even know letters. However, after the treatment, "D" finally started to be able to read even though he had just spelled it. For the current situation, "D" has begun to be trained to read without spelling**	**-**

Based on the results of the study, prior to the treatment of the application of the VAK model based on interactive media, the reading ability of students "D" was still unable to read, there were still many letters mixed up between d, b, p, q and m, n, w. After the treatment of the application of the VAK model based on interactive media, the reading ability of students "D" already knew letters, no letters were mixed up anymore and could read even though it was still stammering. this shows that the application of the interactive media-based VAK model is effectively applied to dyslexic students

5. CONCLUSION

Based on the results of research on the application of the VAK method using learning media in the form of interactive media with the use of learning-to-read applications, Let's learn to read, Play while learning, learn to read, and count, learn to read fluently, can significantly improve the reading ability of dyslexic students. After the treatment of the application of the VAK model based on interactive media, the reading ability of students "D" already knew letters, no letters were mixed up anymore and could read even though it was still stammering. this shows that the application of the interactive media-based VAK model is effectively applied to dyslexic students

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