An Approach to Assist Dyslexia in Reading Issue: An Experimental Study

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Abstract

Dyslexia is a cognitive disorder that emerges as a reading difficulty in childhood. This reading disability reveals itself as the inability to read. Children with dyslexia have difficulty distinguishing visually identical letters, and they perceive writing as a series of scribbles. This makes it difficult for them to comprehend the written material. This study endeavor employs the Fernald method with the intention that it will aid in the improvement of the participants' reading skills. The experimental design was used

to collect data for this study, which involved only one participant. The participants were given a 10-word reading comprehension test as the assessment instrument for this study. At the initial baseline examination, the respondent could consistently read only four out of ten words correctly throughout all four readings. This was the person's lowest score. After receiving four consecutive interventions based on the Fernald technique, the student was able to achieve a score of nine out of a possible ten points, demonstrating achievement. Before taking the drug, the student routinely scored nine out of a possible ten. Before the intervention, the situation was normal. The conclusion that can be drawn is that the employment of the Fernald technique is likely to result in an improvement in the subject's reading skills. The findings may aid parents and educators in assisting children with learning disabilities, such as dyslexia. In addition, the limitations and flaws of this study are provided at the bottom.

Keywords: Dyslexia, Reading, Improvement

Introduction

According to the Roehr (2013), dyslexia is an alternative term for a pattern of learning difficulties (LD) characterized by problems with precise or fluent word recognition, poor decoding, and inadequate spelling skills (Roehr, 2013). Despite the absence of additional hurdles (such as intellectual disability, psychosocial setbacks, and inadequate educational training), individuals with dyslexia are expected to have considerable reading difficulty.

Because of the astonishing abilities exhibited by individuals with dyslexia, society has largely neglected the occurrence of dyslexic children. Certain individuals believe that children with dyslexia are disruptive and should be punished due to their impairment (Huang et al., 2020; Lobier & Valdois, 2015). This viewpoint is predicated on the assumption that dyslexia is a learning disability. Even when teachers engage in social activities, some students are incapable of comprehending the material being presented (Smith-Spark et al., 2016). It has been argued that a significant number of instructors are uninformed of dyslexia, resulting in ineffective instruction for their students (Huang et al., 2020; Knight, 2018). In addition, they have never received dyslexia-specific instruction throughout their entire lives. If a child is placed in an environment that cannot recognize the challenge dyslexic children face, particularly if that environment is a school, the child's academic performance will suffer. This is especially true if the child is placed in an environment that cannot comprehend the difficulties dyslexic youngsters encounter (Maxwell, 2019).

If a person pursues a career in teaching and works in an elementary school classroom where the majority of children are good readers and writers, but one student is not, that student risks being considered as a naive child by the instructor and the other students (Anderson, 2021). If allowed to continue, it will lead to other undesirable behaviors from the outside, such as bullying by peers and members of the community. As a result, the academic performance of children will be affected by a number of factors (Lopes et al., 2020; Maxwell, 2019), such as the generalization of learning strategies by teachers who do not pay specific attention and the absence of positive encouragement from parents to compare their learning outcomes with those of their classmates.

In addition, the generalization of learning procedures by teachers who do not pay specific attention will have a negative effect on the academic achievement of students (Broadbent & Siebers, 2017; Kanani, Adibsereshki, & Haghgoo, 2017). To avoid these situations, it is crucial that both parents and instructors have a comprehensive awareness of the personal features of dyslexic children. All of this is done in the hope that one day every child who struggles with dyslexia will receive the necessary assistance to reach their full potential. Using these programs in primary schools will undoubtedly be of significant help to students with dyslexia, as it will be to their excellent care from their primary school teachers and shadow teachers, who provide a great deal of attention (Ellis, 2016).

In order to give the best possible care for children who suffer with dyslexia and to assist them in discovering and developing their individual skills and interests, it is essential to comprehend dyslexia. This is due to the fact that good treatment is all that is necessary for dyslexic children (Novita, 2016). Understanding dyslexia is the first step towards unearthing the qualities and abilities that lay hidden underneath it. The first step in assisting a child with dyslexia to improve his or her reading and writing skills is for parents, teachers, and other members of the education community to familiarize themselves with the disorder's symptoms. This should be done following the child's dyslexia diagnosis (Ziadat, 2021).

Yet, not all parents are aware that dyslexia is a categorization for children with serious reading and writing learning disabilities and that they have dyslexic children.

As a result, the popular view of the child is that he or she is a "stupid" child, and as a direct result of this assumption, some people incorrectly believe the child has autism (Huettig et al., 2018). When parents observe their children receiving preferential treatment, a phenomena that has come to be associated with negative connotations, researchers observe an additional component of the nature of prestige in certain sectors of our society (Norton, Beach, & Gabrieli, 2015). This characteristic manifests when parents observe their children receiving treatment. But, children do not receive preferential care in accordance with the established standards for them. When low-income parents want to take their child to a doctor (neurologist) or psychologist to obtain a diagnosis, their financial situation presents an additional barrier. This hinders their ability to take their child to the doctor (Novita, 2016).

Nonetheless, we undertake an experiment in this study to increase the reading skills of dyslexic kids. The objective of this study is to improve the reading skills of children who have been diagnosed with dyslexia using the Fernald approach, which is projected to be effective in a relatively short period of time. This experiment will aid those parents whose financial situation presents an additional obstacle.

Literature review

Dyslexia as learning Condition

In addition to dysgraphia and dyscalculia, dyslexia is the most prevalent of the three specialized learning impairments. Dyslexia. "dyslexia" is derived from the Greek words "dys," meaning "difficult," and "lexis," meaning "letters" or "lexical." In other words, dyslexia refers to difficulties with letter- and language-based tasks, including reading, writing, and communicating (Peterson & Pennington, 2012). Some youngsters on this world suffer from dyslexia, a learning disorder that makes reading and writing extremely challenging. According to a 2008 survey by the Child Development Institute, between 3 and 6% of the population has dyslexia (Jamaris, 2014; Prasetyaningrum & Faradila, 2019).

Nonetheless, more than fifty percent of the population reported reading difficulties that were not attributed to dyslexia. Those with dyslexia are as intelligent as

everyone else, and sometimes more intelligent, and should not be stigmatized as dumb. Nofitasari and Ernawati (2015) define dyslexia as a learning condition characterized by difficulties with reading, spelling, writing, and comprehending or identifying the structure of words. Dyslexia is one of the irregularities of brain function development that occur throughout life, and Afrida et al. (2019); Ngong (2019) give an understanding of dyslexia based on internal reasons in the affected individual. According to researchers, the primary cause of dyslexia is a disturbance in memory and central processing linkages, which results in fundamental reading difficulties. In order for a child to develop innate reading skills, he or she must undergo educational and regular cognitive processes devoid of any sensory disruption. Typically, this condition is diagnosed after the child is introduced to the school environment.

It is important to note, according to Yoliando (2020), that dyslexic individuals tend to struggle in five primary areas. (1). Mix the order of letters or words that share a phonetic link, such as D and B, Q and P, or was and saw, left and right, or west and east. containing linear sequences, such as alphabets, schedules, sentences, and instructions. (3) Problems recalling recent events, (4) reading and writing challenges, and (5) motor control and sentence pronounciation issues. Because every child with dyslexia is unique, not all children with dyslexia have all dyslexia symptoms. Yet, in the majority of cases, affected individuals exhibit symptoms from many groups.

Method of Dyslexia Learning

Mulyadi (2010) identifies three approaches to teaching reading to youngsters who are struggling: (a) the Glass Analysis method (b) the Gillingham method, and (c) the Fernald technique. This is a quick breakdown of popular methods:

Gillingham Method

The Orton-Gillingham method provides a structure for reading and writing instruction. It pioneered the idea of teaching reading and spelling through a sequence of increasingly challenging phonics-based practices (Mulyadi, 2010; Sayeski et al., 2019). The Gillingham method is an advanced, highly structured strategy that could take up to five years to master. The first assignment is to practice reading and writing

words containing distinct letter sounds (Sayeski et al., 2019). Children learn the alphabet by tracing each letter individually. In addition, the phonics program is complete when the letter sounds are combined into larger groups. Reading instruction programs commonly incorporate its innovative multimodal approach (Purkayastha, Nehete, & Purkayastha, 2012). This indicates that professors employ several senses into their teachings to assist students in making the mental connection between spoken and written language. Kids with learning challenges are frequently instructed utilizing the Orton-Gillingham method (Hwee & Houghton, 2011).

Glass Analysis Method

The Glass Analysis Method teaches pupils how to hack passwords by analyzing letter clusters within words. This strategy refutes the concept that reading is comparable to encoding or enciphering (Ulfa, 2020). Two assumptions contribute to the success of this method. Reading and decoding are firstly two distinct processes. Second, the password is cracked before to being read. Listening for the correct pronunciation of a given word in order to unlock its contents is what we mean by "password solving." Reading is "the act of reducing the meaning of words in written form," according to one definition. If children struggle to compose secure passphrases, they will not learn to read (Stark, Franzen, & Johnson, 2022).

The Glass Analysis method assists children in learning new words by examining them first as a whole and then as individual letters. This method emphasizes visual and auditory training that is specific to the word being learnt (Stark et al., 2022). The instructor can develop the appropriate instructional materials to teach pupils to recognize letter clusters. Three-by-fifteen centimeter cards can be used to create letter clusters. The instructor writes each new vocabulary term on a separate card. Groups of two or more letters that collectively describe a consistent sound constitute word groupings. This study contributes to the current body of knowledge by providing an alternative to conventional therapy for increasing the language skills of children with dyslexia. The concept of the study is that children's vocabulary development changes before and after exposure to the card. The picture card game has aided in the expansion of children's vocabulary (Miller, 2012).

Fernald Method

The multisensory approach to teaching reading that has developed from Fernald's method is usually known as the VAKT method (Visual, auditory, kinesthetic, and tactile). The child's vocabulary is utilized to select reading material, and each word is presented in context (Arbi & Rianto, 2019; Rababah). This procedure has four steps. Beginning with crayons, the instructor writes the vocabulary words on paper. After that, the child traces the letters with his finger (tactile and kinesthetic). The youngster observes (visually) the writing and reads it aloud while tracing it (auditory). The objective is for the child to be able to accurately write the word without consulting an example. If the child's reading skills have been established, they are documented (Widiati & Ardianti, 2021). In the second phase, the child learns the instructor's handwriting by witnessing the instructor write while speaking. In the third step, students read new vocabulary aloud prior to writing it down. The youngster is now taking the initial steps toward reading the book's text. At the fourth stage, the child may recall the printed words or the taught components of the words.

The researcher employs the Fernald approach due to its several benefits. Among these advantages is the conciseness of the Fernald technique, which the researcher attributes to the fact that it requires only the most basic media, the tools for which are not only simple and clear but also inexpensive and widely available, and the tools themselves can be fabricated according to the user's creative vision (Hanif, Madjdi, & Utomo, 2019; Sommadossi, 2022). Hanif et al. detail a number of additional benefits of the Fernald technique Hanif et al. (2019). The strategy can be easily implemented by regular teachers or parents from a variety of backgrounds, as it requires only patience and no specialized knowledge. Therefore, this method can be implemented with minimal effort (Broadhead et al., 2018).

The objective of this study is to examine the efficacy of the Fernald approach in improving reading skills in children with a dyslexia diagnosis (Zamani Behbahani et al., 2021; Ziadat, 2021). It is anticipated that the Fernald method will assist kids in rapidly improving their reading skills. Theoretically, the findings of the study could guide how clinicians care for children with dyslexia and lead the way for further research. We anticipate that these potential benefits will result in the following. The authors of the

study expect that the findings would be helpful to parents and teachers in assisting children with learning disabilities, such as dyslexia. In other words, this is a more realistic approach to the declared objective of the researchers. In addition, the outcomes of this study may provide parents and educators with a suitable treatment plan for pupils.

Methodology

For this work, the experimental research methodology was utilized. This study employed a technique known as a single-subject design, which involves treating a single individual and then observing the effects of that therapy. Since the variables in this study are independent, the research hypothesis does not involve a comparison or relationship between two or more variables.

At the initial phase of the conducted research endeavor, the observational approach was employed. Seven distinct instances of observation were conducted. Approximately forty minutes of in-home observations were utilized to measure the subject's reading skills. The purpose of the observations was to determine the subject's literacy level. This exercise's precise objective is to detect which letters, syllables, and diphthongs are frequently misunderstood by the subject during the reading test activity included in the subject's textbook. Following the observations, subject instructors at schools were interviewed about the subject's reading ability in order to determine the overall learning conditions related with the topic as well as the subject's reading capacity in particular.

Following the conclusion of the interviews and observations, a three-step intervention was implemented. The first step consists of a test of reading words that have been created based on the results of observations in which the subject has difficulty reading letters-based terms. This examination is conducted by the subject. Instead of receiving therapy based on the Fernald technique, the subject was asked to read words beginning with the numerals 1-10 in the first phase of the trial. The researcher then assigned a score to each word depending on the accuracy of its pronunciation. In the second step, an examination comparable to the first stage's examination was performed; however, in this stage, therapy was provided using the Fernald technique.

The final step, the third stage, consists of a test that is quite similar to the initial test. In this test, the participant's reading ability is assessed without the use of the

Fernald technique. This examination is fairly similar to the one in the initial step. After completing the methodology, the researcher utilized a comparative descriptive statistical technique to conduct a quantitative analysis on the collected data. This entailed comparing the outcomes of the numerous tests conducted at each stage. The researchers in this study examined the data using a range of techniques, including descriptive statistics and many visual analytic techniques.

Results of the Experiment

Baseline 1

This condition's data were collected by applying the Fernald approach to observe the subject's reading skills six times before the intervention. The outcomes of these observations are depicted in the graph below:

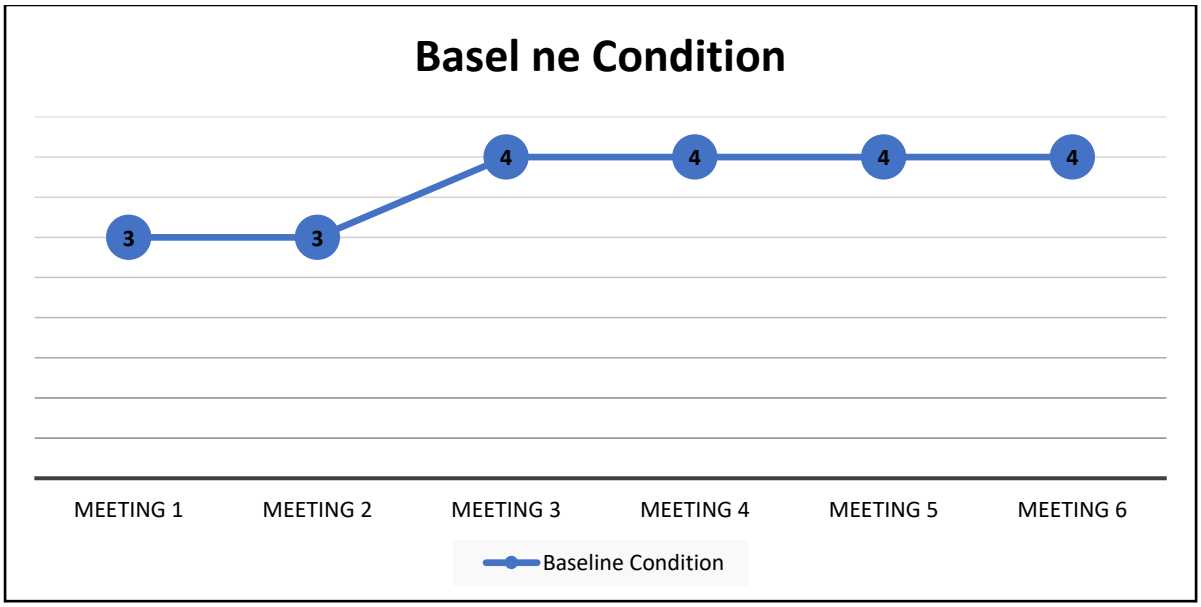

Figure 1. Baseline Condition

During the initial session, the individual in question could only read three of 10 words correctly or flawlessly, including the term "number." The second time we met with the individual, he could only read three numbers accurately or correctly. After then, beginning with the third meeting and continuing until the sixth meeting, the subject could never respond to the same question with more than four numbers. This held true for each of the six meetings.

The initial baseline makes it abundantly clear that the individual being evaluated does not yet have a perfect reading level for all six words being assessed. This is apparent from the outset of the examination procedure. This makes it more difficult for the subject to read the words, as many of them also contain double consonants and double vowels. The initial part of the intervention was carried out without ever employing the Fernald method. The second phase of the intervention was conducted utilizing the Fernald method, and the outcomes are depicted in the image that follows this one.

Experiment Condition

The Fernald method, which only required a total of five sessions, required far less sessions than the previous intervention. This is due to the fact that for each of these sessions, four results were obtained in sequence. This is the cause of the occurrence.

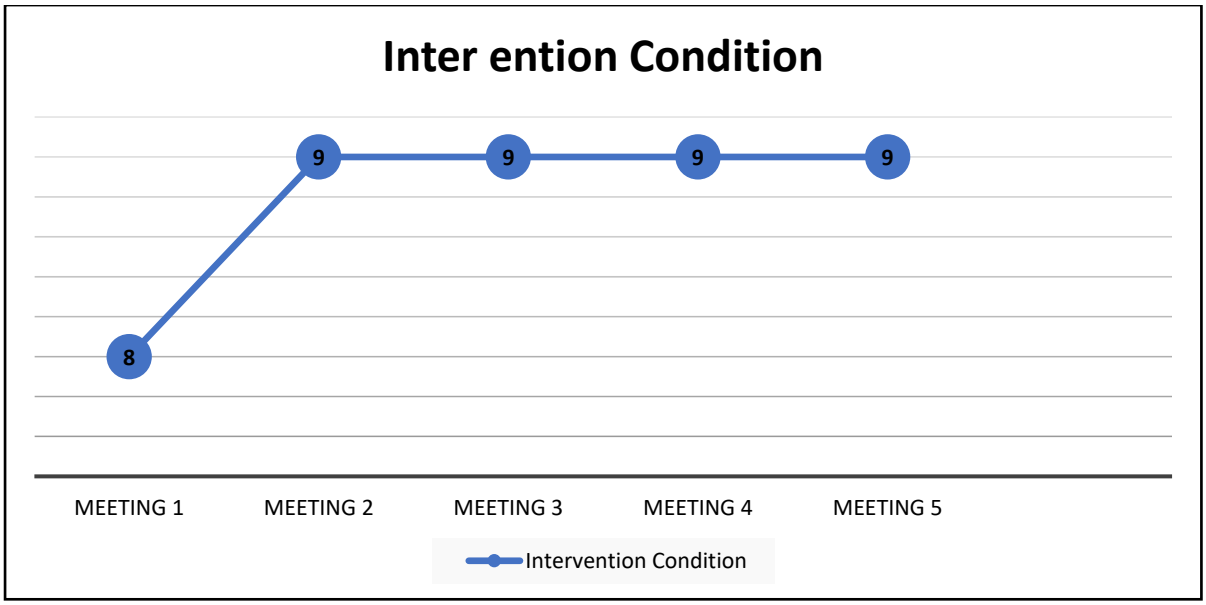

Figure 2. Intervention Condition

The subject ultimately scored an eight out of ten on the test following the initial intervention, which was followed by a significant score improvement. The subject obtained a score of 9 for the second through fifth interventions because he or she did not answer consistently to words consisting of consonants and diphthongs clustered together in a single word across those sessions. Hence, the subject received the score.

Baseline-2

Prior to the intervention carried out during the initial session, the individual was able to read the numbers in the words numbered 3 and 6. Since the beginning of the intervention, the subject's reading abilities have significantly improved, as evidenced by the fact that they can now read 10 new words independently. After that, beginning with the second meeting and continuing through the fifth, the subject was able to accurately read nine of the ten digits of the numbers, with the exception of the tenth number, which he was unable to read completely. This continued until the sixth meeting on the subject. In this particular instance, the word in question contains both double consonants and diphthongs. The following table and graph may be used to compare the outcomes of Baseline 1, Intervention, and Baseline 2 data to indicate the ability to read nouns:

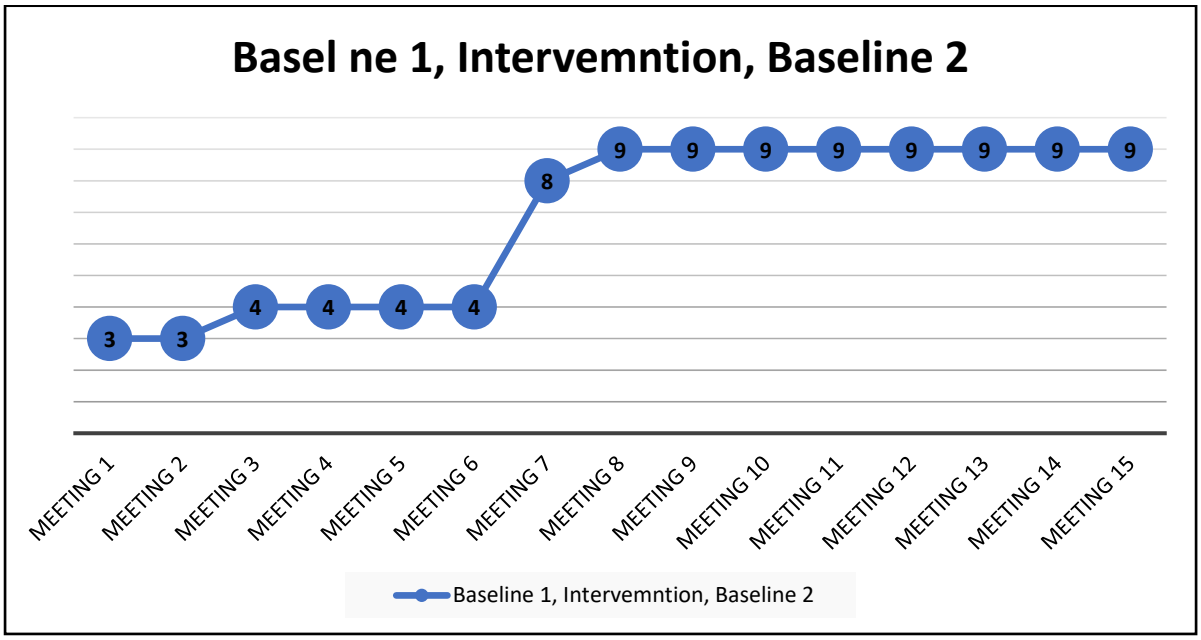

Figure 3. Comparison of the results of baseline 1, intervention, and baseline 2

The results of this study demonstrate that teaching children with dyslexia to read using the Fernald technique improves their reading skills. This is demonstrated by the fact that the student's reading ability score grew by 10 words after treatment with the Fernald approach, as compared to the original baseline score. During the first phase of the study, also known as the baseline phase, a total of six sessions were held, and at each meeting, the researcher administered a 10-word reading test. During the initial meeting of the baseline phase, each participant was given a 10-word reading test. This

examination was administered just once, at the start of the first meeting. A baseline is a state in which the intended aim is assessed under natural conditions prior to the delivery of an intervention. This is performed so that a comparison can be made between the current condition and the desired state. Using baselines permits the monitoring of changes over time. During the first and second encounters with the researchers, the participant could only identify three of the ten terms asked of them. During the meeting, it was said that the subject was unable to read with distinct articulation of different letters and diphthongs, causing the subject to fail seven out of ten words on the reading test. As a result, it was determined that the topic failed the meeting. During the third and sixth meetings, the individual in question could only correctly answer four out of ten words, which was the same level of performance as in the previous meeting.

At the sixth meeting, the researcher determined that it was no longer essential to collect baseline data because the acquired data had reached a steady state. This allowed the researcher to move on to the next phase, intervention implementation. In the majority of cases, the length of the baseline can be shortened by two to five points or lengthened to a particular degree in order to preserve stability (confluence). When collecting baseline data, it is imperative to consider the subject's mood. This is in addition to paying attention to non-technical elements associated with the subject's condition, such as the subject's health and fitness and, in particular, whether or not the subject is fatigued. This is because each of these factors has the potential to have a role in determining the exam's outcome.

Discussion

In this study, the researcher implemented five distinct interventions utilizing the Fernald technique when they were in the intervention stage. The results revealed a significant improvement after each session; specifically, the subject got a score of 8 after the first intervention and scores of 9 following the second through five interventions, respectively. The researcher gathered data during the second baseline, which represented the condition that occurred naturally following the intervention. The subject always received a score of nine, with the same number of incorrect answers. This was accomplished by administering a 10-word reading exam four times with no intervention provided. This result indicated that the subject had successfully

adapted to the implemented intervention. According to the findings of the researchers, the second baseline stage should also include a time lag (in days) immediately after the intervention. If this were done, there would be a lower likelihood that the individual remembered the exam questions.

It is asserted that the Fernald methodology can increase a subject's reading skills because the researcher can utilize nearly all of the subject's five senses while applying the Fernald method. This shows that even if a person has a limitation in one sense in terms of their capacity to send sensors to the brain during reading activities, there are other senses that are advantageous. In other words, even if a person's capacity to send sensors to the brain during reading activities is impaired due to a lack in one of their senses, they are still able to read. The Fernald technique provides this advantage, which is an advantage in the application of the approach, because it employs nearly all of the senses. This advantage is a plus for the implementation of the technique. In this particular study, the participant's parents admitted that their son had visual problems or impaired vision and had been evaluated by an ophthalmologist numerous times. The ophthalmologist determined that the individual had vision problems or poor eyesight, despite the fact that the subject did not appear to have worn glasses for daily activities. Hence, when employing the Fernald approach, the researcher strives to maximize the subject's other sensations, specifically the ears and the skin. This differs from the conventional learning process, in which the subject is accustomed to only scanning the text before beginning to read it. Because children with dyslexia may benefit from comprehensive and effective intervention programs, which may assist them in enhancing their skills and maximizing their potential.

A Fernald-based intervention is one that, according to the findings of the research conducted, has the potential to increase a person's reading skill by 10 words. This is demonstrated when the data is reviewed using visual analysis based on the processing of the received data, indicating that the Fernald technique is successfully used to improve the subject's reading abilities. When the data was processed and received, this was displayed. The outcomes of this study could be explained by noting that the conclusions were derived from statistics charts that were meticulously recorded at each meeting. This would demonstrate that the conclusions are trustworthy.

Conclusion

Based on the findings of this study, it is plausible to conclude that teaching dyslexic youngsters to read using the Fernald technique may help improve their reading skills. This conclusion is backed by the research findings. This was demonstrated by an increase in the reading score of 10 difficult words, as determined by the evaluation results. This study's findings will be analyzed, and it is hoped that they can be used in educational settings, particularly inclusive educational environments that are likely to have kids with reading challenges. In the meantime, public schools with limited human resources, such as the absence of a shadow teacher, are only able to provide instructors with the competence to use the Fernald approach, which research finds to be a somewhat condensed form of education. Therefore, it is imperative that parents of children with dyslexia employ this method with their children. Because a greater number of meetings with children will undoubtedly produce more desirable outcomes if they participate in its implementation, meetings should be held more frequently. Moreover, it is imperative that parents of children who struggle with reading implement this method with their children.

Limitations

One of the limitations and flaws of this study is that it only examines a restricted number of intervention settings. This study focuses specifically on the situation in which the intervention was administered five times. The researcher chooses five repeats of the treatment based on considerations of time and the subject's condition, which has demonstrated a consistent trend; however, the intervention is terminated after the fifth session since the subject has hit a plateau. This is despite the fact that the researcher has a rationale for selecting five repeats of the treatment, which is based on time and the subject's condition, which has demonstrated a continuous pattern. The drawback of this study is revealed by the trend from intervention to baseline 2 that continuously displays the same score.

In addition to the relatively restricted number of treatments, which is another evidence of the study's weakness, the relatively limited number of

treatments is also a sign of the study's weakness. The researcher assumes that it is possible for the individual to have committed the words to memory that will be investigated. This is what the researcher hypothesizes. Despite this, individual researchers as well as other researchers must place a larger emphasis on attentive observation. For instance, the selected modules should correspond to the prerequisites of the subjects. In addition, it is recommended that the number of subjects be raised in future research in order to gain a greater understanding of the success of Fernald's technique in treating dyslexic youngsters.

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