

EFFECT OF MULTI-SENSORY APPROACH ON READING PERFORMANCE OF PUPILS WITH
READING DISABILITY IN JOS METROPOLIS, PLATEAU STATE.

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ABSTRACT

This research investigated the effect of multi-sensory approach on reading performance of pupils With Reading Disability in Jos Metropolis, Plateau State. Specifically, the study geared to find out the level of sight word vocabulary of level 5 pupils with reading disability before intervention and establish the level of sight word vocabulary of level 5 pupils with reading disability after intervention. The target population of this study include all the 9 pupils in level 5 identified with reading disability in Open Doors Special Education Centre, Jos. The sample was drawn out of the 9 pupils in level 5. 5 pupils with reading disabilities in level 5 who served as experimental group A, another 4 pupils with reading disabilities from level 5 served as control group B. In this study 9 pupils in level 5 who have reading disabilities were used. The sample method used for this research project was the purposeful sampling methodology. Simple percentages and mean scores was used to answer the research questions. While the t-test of independent samples was used to analyze the hypotheses at 0.05 level of significance. The statistics were generated using Statistical Package for Social Sciences (SPSS) version 25. The results indicated that students in the control group outperformed those in the experimental group by a little margin and that students in the experimental group outperformed those in the control group. This suggests that a multisensory approach to teaching, in particular, stimulates students' senses of hearing, vision, touch, speech, taste, movement, and action. It was concluded that Students with reading impairments usually perform below grade level when it comes to reading. It was then recommended amongst others that when instructing students with reading disabilities or any other kind of reading issues, educators should utilize a multisensory approach; Reading instruction and English language instruction should be provided separately and by distinct teachers in primary schools and that in order to enhance the reading comprehension skills of beginning readers and help them identify words, educators must provide sufficient interactive teaching resources.

Keywords: Educators, Interventions, Multi-sensory, Reading disability and Reading performance.

INTRODUCTION

Research and experience over the years, has proven that reading proficiency and educational achievements are closely related, this means that a student's proficiency in the instructional language is a requirement for effective learning. Reading is not just one of the subjects in the curriculum; it is the essential vehicle for learning all subjects. Reading is an exchange of ideas between the author and the reader. Understanding and mental comprehension are the primary communicative goals associated with reading. When a reader is able to identify or locate the major ideas that are clearly presented in a reading material, this is known as literal comprehension, the major ideas in the passage are identifiable or easily found by the reader and are expressed openly. For many years, educators have emphasized the need to have an effective reading programme. A good reading strategy helps your students comprehend what they read by teaching them to evaluate ideas and come to logical conclusions. In order to foster good reading habits, the strategy should be interesting to all students and tailored to their requirements, abilities, and interests. It is imperative that educators embrace the breadth and order of a reading curriculum in addition to specific learning goals. The inability to read could be caused by the employment of ineffective teaching practices while teaching reading, or simply by the difficulty of learning to read

in a second language, in this case "English.". In order to succeed academically and acquire effective knowledge, one must be proficient in reading. The ability to accurately and completely perceive printed material is a major prerequisite for learning.

Non-readers with reading disability are found in elementary schools, these are pupils who are unable to read simple sight vocabulary or utter English words orally. One is said to have reading disability when there is a significant discrepancy between his reading level and his intellectual potential as measured by standardized tests (Gumut, 2023).

Reading performance is the efficiency and effectiveness with which a child comprehends and processes written information. It encompasses various aspects, including decoding words, understanding vocabulary, grasping sentence structure and deriving meaning from passages read. It can be measure by various metrics, such as reading speed, reading accuracy and reading comprehension. Reading proficiency is a measure of one's capacity to understand, apply, and reflect on written materials in order to accomplish goals, expand knowledge and potential, and participate in society. Children that struggle with reading are those whose reading proficiency is lower than that of their peers, according to the National Assessment of Educational Progress (2007).

Interpreting textual and printed materials by decoding, comprehending, or interpreting them is the skillful language processing action known as reading. It refers to an interactive or communicative process in which the reader actively participates in deriving meaning from the text utilizing his prior knowledge and visual or non-visual signals (C.L Madda & T.E.Raphael, 2010). Reading answers interpretative, critical, and evaluative inquiries in addition to being able to react to questions that are literal or true. This implies that reading is a cooperative activity in which the text itself, the author, and the reader are all involved. It is clear that reading also involves literacy skills such as writing, spelling, sight word recognition, propensity to read more high frequency words and the expression of simple sentences. For students who struggle with reading, these reading-related elements may be tough. Within school-aged children, reading disability (R.D) is common throughout the world and was first recognized more than a century ago (Nourbakhsh, 2014). R.D could have an impact on any part of reading, such as the inability to recognize words accurately and fluently, have trouble decoding words, or have trouble understanding what is being read (Sedaghati, 2010).

STATEMENT OF THE PROBLEM

The difficulties that students with reading disabilities face in their reading performance served as the impetus for this investigation. The need to be competent in using essential life skills, live independently, and find successful employment is just a few of the primary aims of educating individuals with learning disabilities. Despite the fact that reading disabilities are not physically visible, they can remain untreated in schools even if they are regarded as major educational issues. Decoding and comprehending printed material can be extremely challenging for students with reading disabilities. Regardless of the kind of reading difficulty a student has, the circumstances usually make it difficult for them to decode, which is necessary for understanding and recall. Pupils with reading disability have difficulty in comprehending written text and understanding complex words from a passage which can lead to poor reading performance. Reader assistance is greatly influenced by the teacher's approach to instruction. Readers with reading disabilities who get good instruction will be given the tools to build on their strengths, overcome their shortcomings, and receive rehabilitation in a timely manner. This makes it possible for children to benefit from efficient learning techniques as they start to recognize and interact with their own unique learning preferences, requirements, and interests. As a result, it is crucial to use the appropriate techniques to educate students with reading disabilities. Extraordinary methods, like the one outlined in the multisensory approach, should be deliberately employed to teach, keeping the aforementioned concerns in mind, if students' reading and comprehension performance is to be regarded seriously. Thus this researcher is determined to examine the effectiveness of using multi-sensory approach to teach reading to pupils with reading disability in Jos Metropolis, Plateau

State.

AIM AND OBJECTIVES OF THE STUDY

The research examine the effect of multi-sensory approach on reading performance of pupils with reading disability in Jos metropolis, Plateau State. Specifically, the study intended to achieve the following objectives:

- i. To find out the level of sight word vocabulary of level 5 pupils with reading disability before intervention.
- ii. To establish the level of sight word vocabulary of level 5 pupils with reading disability after intervention.

RESEARCH QUESTIONS

The following research questions were formulated to guide the study.

- iii. What is the level of sight word vocabulary of level 5 pupils with reading disability before intervention?
- iv. What is the level of sight word vocabulary of level 5 pupils with reading disability after intervention?

HYPOTHESES

The following hypotheses will be tested at 0.05 significance level:

- i. There is no significant difference in the reading performance mean scores of pupils with reading disability in reading comprehension taught using multi-sensory approach and those taught without.
- ii. There is no significant difference in the sight word vocabulary performance mean scores of pupils with reading disability in the experimental and control groups after intervention.

LITERATURE REVIEW

CONCEPT OF LEARNING DISABILITIES (L.D)

Learning disabilities (L.D) have been a subject of study interest for more than a century, and over that time, more and more people have become aware of these differences thanks to the brain research that formed the basis of the field of learning disabilities. Although many researchers have contributed to the field, the seminal works of two important scientists are phenomenal even today. Adolf Kussmaul, a German neurologist, was the first to identify reading difficulties and coin the term "word blindness" in 1877. It's still possible to see, think, and speak, but he describes it as "complete text blindness." The phrase "word blindness" first arose about 10 years ago, although

Berlin (1887) coined the term "dyslexia" to describe reading disabilities. An individual's academic underperformance in reading, writing, and/or mathematics despite having average to above average IQ, proper education, regular attendance at school, and supportive contextual circumstances is the defining feature of a learning disability.

As children with learning disabilities do not appear to be physically impaired and their challenges are not visible, learning disorders are sometimes referred to as hidden disabilities. Children with learning disabilities suffer from low self-esteem, confidence, and drive as a result of being misinterpreted and accused of being inattentive, slow, or clumsy.

Thus, if a child shows an educationally significant discrepancy between their actual academic performance and their expected intellectual capacity that cannot be attributed to intellectual potential, we can diagnose the child with a learning disability.

These kids may struggle with a variety of skills, including concepts, spelling, reading comprehension, writing, speaking, and listening.

LD is a neurodevelopmental disorder that is not brought on by issues with hearing, vision, social or economic status, cultural or language diversity, lack of motivation, or inadequate or poor training. The interplay of genetic, epigenetic, and environmental factors having a biological basis influences

the brain's ability to efficiently and accurately receive and/or understand spoken and non-verbal. Learning disabilities are more complicated and have numerous dimensions than the common misconception that they are limited to letter or reading difficulties. The meanings they influence and the degree to which the impact is felt vary substantially. The right modifications depend on the person's abilities and the particular difficult situation.

A broad spectrum of problems that may hinder the acquisition, organization, retention, comprehension, or utilization of verbal or nonverbal knowledge are included under the umbrella term "learning disabilities". These illnesses have an impact on learning even in people who otherwise demonstrate at least average abilities required for thinking and/or reasoning. Consequently, learning impairments and intellectual disability are not the same thing. Deficits in one or more processes related to perception, cognition, memory, or learning result in learning impairments. Among these are executive functions (such as planning and decision-making), linguistic processing, phonological processing, visual-spatial processing, processing speed, memory, and attention.

Types of Learning Disabilities

The seven disorders described below are regarded by many experts, as distinct learning disabilities. They distinguish Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) as two separate but linked disabilities that affect learning.

1. Dyslexia

The most prevalent learning disability, accounting for at least 80% of all LDs, is dyslexia which is also known as reading disability, a specific learning disability that affects reading and related language-based processing skills. It can coexist with other associated problems and have an impact on reading fluency, decoding, reading comprehension, recall, writing, spelling, and occasionally speech. However, each person's level of severity can vary, and dyslexia is occasionally referred to as a language-based learning disability.

Symptoms of Dyslexia within school-aged children

School age children struggle with delayed speech, pronunciation, rhyming words, learning shapes, colors, and writing their name. They struggle with retelling stories, lack interest in language games, and recognize letters in their own name. They struggle with spelling, reading, and spelling words. They struggle with one-syllable words, connecting sounds and letters, sequencing numbers and letters, and frequently mistaken letters. They avoid reading aloud and require repeated reading to understand complex language.

2. Dysgraphia

Dysgraphia is a specific type of learning disability that impairs fine motor skills and legible writing. It is defined by poor writing skills that significantly lag behind the child's age, IQ, and level of education and impede their ability to advance in other important aspects of their lives, such as school.

Spelling disorders and spelling dyslexia are other names for dysgraphia. Illegible handwriting, irregular spacing, and poor spatial awareness are all potential issues. Paper-based planning, bad spelling, grammatical and punctuation problems, and sloppy handwriting are further characteristics. The kids have a hard time thinking and writing at the same time when they're writing. This is related to issues with fine motor abilities or visual-motor integration. Writing skills include both transcription and composition (text generation). Delays in skill development and effective functioning in one area might be caused by neuropsychological variables such as challenges with any one of the following: transcribing, listening or reading comprehension, working memory, etc. Through twin studies and molecular genetic studies, research also sheds information on the significance of genetics.

Symptoms of Dysgraphia within school-aged children

Students often struggle with writing due to various issues such as excessive difficulty in composing, technical faults in punctuation, grammar, word usage, sentence structure, and improper organization. They also struggle with basic writing activities like taking notes, confusion between similar letters or sounds, inability to choose the correct spelling, consistent use of non-permissible letter strings, inconsistent page positioning, uneven spacing between words and letters, and a cramped grip.

3. Dyscalculia

Dyscalculia refers to a kind of learning disability that makes it difficult for a person to learn math concepts and facts and to comprehend numbers. Aside from having issues understanding math symbols, people with this type of LD may also have trouble remembering and organizing numbers, keeping track of time, or counting. It is conceivable that later grades will have reasoning problems, whereas early math or basic concept problems will arise. Children suffering from dyscalculia may also lack the ability to distinguish important information from irrelevant data, choose the proper computing technique, or assess the suitability of the solution they come across (Jordan & Hanich, 2003). Numerous psychological, neurological, genetic, environmental, and emotional factors might contribute to dyscalculia. Number processing primarily occurs in the inferior parietal sulcus. Affective traits like motivation and anxiety, low-income households, schooling, and other environmental factors can all contribute to children's poor mathematical aptitude and psychosocial challenges.

Reading

Literacy is the most crucial component of a top-notch education. Pupils who lack adequate literacy skills forfeit sources of enjoyment and enrichment as well as the necessary creativity and relevant information about health, social, cultural, and political issues (Baatjies, 2003; Gunning, 2007; Bella, 2013). Students can easily access a large universe of knowledge, pleasure, and happiness through reading. Reading is the most crucial literacy skill that young students need to acquire, and it has been underlined that reading is a part of nation building.

Pupils' academic success is strongly correlated with their inability to read. The ability to read well is a prerequisite for learning, and students who lack this ability may find it more difficult to succeed in the classroom. Through reading culture, one can develop their talent at reading while simultaneously learning essential information. Reading, whether from a textbook, the blackboard, or the media, accounts for the majority of classroom instruction in a formal educational setting. People have pointed out that reading fluency is a basic life necessity.

Reading is "magical," according to Shaywitz & Shaywitz (2005), since it opens up a world of knowledge, pleasure, and happiness. Once someone learns to read, they feel different from people who cannot read. Even with reading's beneficial effects, there are still many places in the world where students struggle with reading comprehension. A reading disability occurs when a person is unable to quickly and independently identify words in context.

Students who wish to learn English must be able to do all four of the language's fundamental functions: speaking, listening, reading, and writing. Of the four fundamental talents, reading is regarded as the most crucial. Compared to other areas of education, it has gotten greater attention. Like listening, reading falls under the category of receptive skills. This implies that rather than creating text, it involves responding to it.

Various people define reading in different ways. "Reading is the process of getting the meaning of something written out of printed material by interpreting its characters or symbols," claims Swihart (2009). Reading is the process of fully understanding a new language's meaning through the symbols that are used to represent it. It is considered a second language.

Harris, however, believed that "reading is the meaningful interpretation of written or printed verbal symbols which also involves sensing, perceiving, achieving meaning, learning and reacting in variety of ways." According to these definitions, reading is an attempt on the part of the pupils to

comprehend, grasp, translate, and imbue the written form with meaning in order to communicate the meaning and information from the book. Thus, it can be said that reading involves more than just looking at words as pictorial symbols; it also entails deriving meaning from words in order to comprehend a text's content and extract information from it. Reading is the most important skill that pupils should acquire in school since learning requires reading comprehension. Reading is a talent that should be applied to all human endeavors since it is necessary for both learning and efficient communication. In all areas of education, reading is used as a communication tool and as a medium of instruction in classrooms. It also acts as the basis for additional educational components. Before a pupil leaves elementary school, one of the most important abilities they can have is the ability to read for meaning freely and successfully. Thus, the primary school's top aim or objective should be reading. It is crucial that students with reading impairments have the knowledge and abilities they need to read, and the best method to support these students is to identify those who are most likely to develop dyslexia at a young age and provide them with interventional reading skills training.

The Importance of Reading

Proficiency in reading becomes crucial in the field of education. Students who read may learn useful information that their teachers do not present in the classroom. Moreover, reading comprehension makes up about half of the items in the national final test. As a result, instruction is necessary for students to develop strong reading skills. Through reading, the student can gain the speed and proficiency necessary for real-world use after graduation. It is quite difficult to envisage any skilled work in our literate society that does not require the ability to read.

Put another way, it is imperative that language learners acquire reading skills because they will be valuable to them as they continue their education, especially schoolchildren.

Processes in the Development of Reading Skills

Working memory, phonological processing, syntactic awareness, semantic processing, and orthographic processing are the five key processes in the development of reading skills in the English language (Siegle, 2003). These procedures are often incorporated concurrently (Munro, 2005). Making the connection between sounds and letters or letter combinations is known as phonological processing, or phonological awareness. This ability is thought to be essential for reading comprehension in print and for the early acquisition of the core phonological and alphabetic reading skills that support fluent word recognition. According to Westwood (2011), phonological awareness is the ability to distinguish between the sounds in words, or phonemes, and to blend—the process of joining sound units to form a word—as well as the ability to segment words and recognize rhymes and alliterations.

According to Melby-Lervag, Lyster, and Hulme (2012), it is regarded as one of the finest indicators of reading success and individual variations in reading achievement. The comprehension of language's syntax is known as syntactic awareness, or grammatical sensitivity (Siegle, 2003). To properly construct sentences, one must be aware of the word order norms (Vellutino, Fletcher, Snowling, & Scanlon, 2004). The ability to predict the words that will follow next is a prerequisite for grammatical awareness, which allows for fluid and effective text reading. According to Vellutino et al. (2004), it assists the learner in identifying when they make mistakes in their reading so that they can remedy themselves. Understanding word meaning is referred to as semantic processing (Siegle, 2003). It helps the reader to infer meanings regarding unknown words from the context of the sentence or narrative in which they appear (Chapman & Tunmer, 2003). Understanding the writing norms of the language being read and being aware of proper and erroneous spelling are aspects of orthographic processing (Siegle, 2003).

It necessitates knowledge of the arrangement of letters in words. This comprehension encompasses the following: an awareness of the gaps that exist between words; an awareness of letter sequences that are appropriate and inappropriate; and knowledge of word pronunciation, meaning that letters indicate distinct sounds based on their placement within words (Cassar &

Treiman, 2004).

The capacity to process and retrieve information from long-term storage in addition to holding information in short-term storage is referred to as working memory (Siegle 2003). It is crucial to the reading process because it requires the reader to coordinate multiple tasks, such as word recognition or decoding, with memory for previously read material and linguistic rule recall. Core processes in the formation of literacy are thought to be phonological awareness and phonological coding in working memory (Meschyan & Hernandez, 2004; Troia, 2004).

Working memory is said to predict variance in reading ability beyond phonological awareness, according to Troia (2004) and Meschyan and Hernandez (2004). For gifted readers and students with specific reading disabilities, there are differences in the development of these five processes: phonological processing, syntactic awareness, semantic processing, orthographic processing, and working memory. To help teachers make better decisions about how to deliver high-quality, productive instruction, research highlighting these variations is therefore necessary. There is variation in reading proficiency, so it is not realistic to expect all students to acquire reading skills in the same manner. It is a widely accepted notion that there have been "pendulum swings" between educators' employment of the two reading approaches that have dominated reading teaching over the past few decades (Stahl, 2006). Stahl (2006) claims that there have been ongoing fluctuations in the use of direct phonics instruction and whole word approaches, which emphasize context and meaning. More recently, it has been determined that a "balanced" approach is necessary, combining comprehension and decoding strategy teaching (Stahl, 2006). This method acknowledges that some students' characteristics will make it difficult for them to learn using traditional reading ways, necessitating adjustments to account for variances in each student's strengths and limitations.

READING DISABILITY

The idea of a reading handicap is poorly understood even if it is widely acknowledged. The conventional classification of reading disability is unexpected underachievement, which is characterized as a discrepancy between performance and intellectual capacity, even in the presence of sufficient learning opportunities and without the presence of sensory problems or cultural disadvantage. Operationally, this disparity is frequently referred to as the IQ and test result reading difference. Each nation defines what constitutes a qualifying disparity differently. While children who do not fit this criteria may nevertheless face severe difficulties learning to read, they are not eligible for special education assistance under the subject of learning impairments. While some dyslexic or compensatory education programs offer supplementary reading instruction to struggling learners who do not demonstrate the necessary achievement-aptitude disparity, in many other settings they do not. A small percentage of schools rely more on expert opinion than on IQ-achievement gaps to determine if students are eligible for reading assistance. It is believed that the most prevalent type of learning disability is reading disability (Fletcher, 2007). It will be difficult for a student with a reading disability to complete text-based assignments in any academic subject (Daniel, 2006). Because these pupils typically have to study the requirements before they can be assessed, it also becomes challenging for them. While they might be able to understand the needed response by reading the question when it is offered in text form, they might not be able to do so when the examiner asks them questions verbally (Fox, Dinsmore, & Alexander, 2010). Thus, reading difficulty is not only the most prevalent type of learning disability, but it also carries the most potential to influence a student's academic performance in all areas.

One of the most common and well-researched reading disabilities is associated with difficulty reading single words. These single-word reading problems could be caused by phonological processing core deficiency. For people who struggle with reading, applying the alphabetic principle to quickly and correctly decipher words can be very challenging. Understanding, fluency, and decoding become challenging for the student as a result. Less common and poorly understood is the connection between reading impairments and language comprehension problems. This handicap affects certain people with normal phonological

processing skills but struggles with key idea identification, summarization, and inference; decoding problems are far more widespread than this disability.

It is clear that this task is difficult when reading or listening to text. Some children who find it difficult to learn to read are among the children who struggle with both language comprehension and decoding. It may be argued, therefore, that students in this latter group have the highest demands and the most severe reading deficits. Reading problems include conditions and developmental delays that affect reading abilities. Dyslexia is a reading handicap, even though not all reading problems are caused by it. Common signs of most reading disorders include writing difficulties, school challenges, reading anxiousness, and delays in reading. Coherently, A few elements that were closely relevant to the above topic were thoroughly reviewed as part of the study that looked into how the multisensory approach affected the performance of students with reading problems at Open Doors Special Education Center. To the best of the researcher's knowledge, no research has been done at the Open Doors Special Education Centre, for Special Learners, located on Liberty Boulevard in Jos. However, studies related to the current study have been completed in the Jos North Local Government Area inside the Jos metropolitan. This served as the study's basis. Despite being conducted in a variety of schools, this study aims to close any gaps that were found during the research process.

METHODOLOGY

The target population of this study include all the 9 pupils in level 5 identified with reading disability in Open Doors Special Education Centre, Jos. The sample for this research was drawn out of the 9 pupils in level 5. 5 pupils with reading disabilities in level 5 who served as experimental group A, another 4 pupils with reading disabilities from level 5 served as control group B. The researcher worked with only 9 pupils in level 5 who have reading disabilities. The sample method used for this research project was the purposeful sampling methodology. The study used the sight word recognition test of 100 high frequency words developed by Umolu (2017) and Words and sentence comprehension passage which is an assessment designed by teachers to gauge level 5 students' reading comprehension. Simple percentages and mean scores was used to answer the research questions. While the t-test of independent samples was used to analyze the hypotheses at 0.05 level of significance. The statistics were generated using Statistical Package for Social Sciences (SPSS) version 25.

Findings

Summary of finding the reading performance mean scores of pupils with reading disability in reading disability in reading comprehension taught using multi-sensory approach and those taught without.

One-Sample Test						
Test Value = 0						
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
mean scores of vocabulary level of level 5 pupils with reading disabilities before intervention	51.776	67	.000	18.96035	18.2294	19.6913
EXPERIMENTAL						

Source: Research Data, 2024

The one-sample t-test is comparing the mean scores of vocabulary level of level 5 pupils with reading disabilities before intervention (experimental group) to a test value of 0. The t-statistic is significant ($p < .05$), indicating that the mean difference is unlikely to be due to random chance. The mean difference is approximately 18.96, and the 95% confidence interval for this difference is

between 18.23 and 19.69. We therefore conclude that there is significant difference in the reading performance mean scores of pupils with reading disability in reading comprehension taught using multi-sensory approach and those taught without.

Null Hypothesis Two (H_{02}): There is no significant difference in the sight word vocabulary performance mean scores of pupils with reading disability in the experimental and control groups after intervention.

Table 7: Summary table for finding the significant difference in the sight word vocabulary performance mean scores of pupils with reading disability in the experimental and control groups after intervention.

One-Sample Test						
Test Value = 0						
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Posttest mean (x) score	24.561	67	.000	52.91674	48.6165	57.2170

Source: Research Data, 2024

The p-value associated with the t-test. It indicates the probability of observing the sample mean (or one more extreme) if the null hypothesis (that the population mean equals the test value) is true. A small p-value (in this case, .000) suggests strong evidence against the null hypothesis. The t-value is 24.561, indicating a substantial difference between the sample mean and the test value.

With a p-value of .000 (very close to zero), there is strong evidence to reject the null hypothesis that the population mean equals the test value. We therefore conclude that there is significant difference in the sight word vocabulary performance mean scores of pupils with reading disability in the experimental and control groups after intervention.

DISCUSSIONS

This study looked into how primary five students with reading disabilities performed when using a multisensory method in Jos, Plateau State. To direct this study project, two research questions and two hypotheses were developed. The first research question looked at the level of sight word vocabulary at which level 5 students with reading disabilities started before receiving assistance. Table 2's results indicated that students in the control group outperformed those in the experimental group by a little margin. This suggests that a multisensory approach to teaching, in particular, stimulates students' senses of hearing, vision, touch, speech, taste, movement, and action. This increases the number of channels through which information can enter students' cognitive systems and helps them form connections between previously learned material and new information. The second research question examined the sight word vocabulary of level 5 students with reading disabilities following an intervention and the degree to which a multisensory approach enhances vocabulary acquisition in students' reading performance following an intervention. Table 3's results demonstrated that students in the experimental group outperformed those in the control group. The outcome is consistent with Rasinski and Padak's (2004) findings, which show that using a multisensory approach to word recognition can aid students in understanding new words and identifying patterns in lengthy unfamiliar terms.

CONCLUSION

This study set out to find out how a multisensory approach affected the reading proficiency of students who had reading difficulties. Students with reading impairments usually perform below grade level when it comes to reading. This is amply demonstrated by the students' incapacity to recognize the 100 high frequency words, read simple sentences, and understand the words or sentences they read. This causes great concern for educators and other parties involved in the education of students with reading impairments.

RECOMMENDATIONS

The research's conclusions lead to the following recommendations:

1. Word recognition should be taught to students earlier in their education by all instructors, regardless of special needs or general education.
2. When instructing students with reading disabilities or any other kind of reading issues, educators should utilize a multisensory approach.
3. Reading instruction and English language instruction should be provided separately and by distinct teachers in primary schools.
4. In order to enhance the reading comprehension skills of beginning readers and help them identify words, educators must provide sufficient interactive teaching resources.
5. The ministry of education and schools should provide teachers with a sufficient quantity of multi-sensory oriented reading resources, given the capital demands of the materials. Funding and resources must be set aside for Jos metropolitan schools to purchase multisensory equipment, supplies, and technology in order to enable successful adoption.
6. Encourage the inclusion of multisensory teaching methods in regular classroom settings to help students with reading difficulties in Jos.

REFERENCES

- Academy of Orton-Gillingham Practitioners & Educators (2012). *The Orton-Gillingham approach: Overviews*. <http://www.ortonacademy.org/approach.pho>
- Ali, N. (2010). *An evaluation of the reading text and exercises in SB and WB of English for Palestine-grade 9*. M.A Thesis. Islamic university Gaza. Available: elibrary.iguaza.edu.ps
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC.
- Andzayi, C. & Umolu, J. (2004). *Reading instructions in primary and secondary schools*. (Rev.ed) Department of Special Education University of Jos, Jos Nig.
- Ashbaugh, A. (2016). *Multi-sensory techniques in spelling instruction: an action research of study for pupils with dyslexia*. Otterbein University
- Ashburn, D, L. & Snow, B, K. (2011). *Dyslexia: Awareness and intervention in the classroom*. Retrieved from Sacramento State, Scholarworks.
- Awotunde, P. O., & Ugodulunwa, C. A. (2004). *Research methods in education*. Fab Anieh (Nig.) Ltd
- Avdyli, R., Cuetos F. (2012). Reading difficulties in Albanian. *Annals of dyslexia*, 62, 137- 52.
- Bamberger, R. (1975). *Promoting the reading habit*, UNESCO.
- Basu, A., Memillod, M. (2011). Emotional intelligence and social-emotional. *Psychology Research*, 1, 182-185.
- Bean, R.M. (2004). *The reading specialist: leadership for the classroom, school and community*. Guilford Press.
- Bella, D. H. (2013). *Reading difficulties experienced by learners in the foundation phase in inclusive school in Makapanstad, South Africa*.

- Berg, B. (2007). *Qualitative research methods for the social sciences (6th ed)*. Boston: Pearson Education.
- Bishop, A. G., & League, M. B. (2006). Identifying a multivariate screening model to predict reading difficulties at the onset of kindergarten: A Longitudinal Analysis. *Learning Disability Quarterly*, 29, 235-252.
- Birsh, J.R. (2018). *Multi-sensory teaching of basic language skills (4th ed.)* Baltimore, MD: Paul H. Brooks Publishing.
- Block, C., Gambrell, L. & Pressley, M. (2002). *Improving comprehension instruction rethinking research, theory and classroom practice*. San Francisco. Jossey-Bass. Retrieved from: www.thefreelibrary.com
- Bohlmann, C. and Pretorius, E. (2002). Reading skills and mathematics. *South African Journal*.
- Burck, C. (2005). Comparing qualitative research methodologies for systemic research: the use of grounded theory, discourse analysis and narrative analysis. *Journal of Family Therapy*, (27).Pp.237-262.
- Bryman, A. (2004). *Social research methods*. Oxford University Press, Inc.
- Cambria, J. & Guthrie, J. T. (2010). *Motivating and engaging pupils in reading*. University of Maryland.US.
- Carr, W. and Kammis, S. (1986). *Becoming Critical: Education, knowledge and action research*. Falmer Press.
- Caylak, E., (2010). The studies about phonological deficit theory in children with developmental dyslexia: Review. *American Journal of Neuroscience Elazig, Turkey* 1(1):1-12,
- Clinard, L. (2005). *Family time reading fun (3rdEd.)*. California: Kendall Hunt Publishing.
- Comber, B. (2003). Critical Literacy: What does it look like in the early years?" in Handbook of Early Childhood Literacy, N. Hall, J. Larson, and J. Marsh, Eds., pp. 355–368, Sage.
- Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, (2nded), Shalden Collins, Sage Publications.
- Creswell, J. W. (2008). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. 3rd ed. *Upper Saddle River, N.J.*: Pearson/Merrill Prentice Hall.
- Culham, A. & Nind, M. (2003). Deconstructing normalization: clearing the way for inclusion. *Journal of Intellectual & Development Disability*, 28, 65-78.
- Dale, E. (1969). *Audio-visual methods in teaching*. (3rd ed). Holt, Rinehart & Winston.
- Dalecki, C. G. (2007). *Improving letter and word recognition using a multi-sensory approach. Education and Human Development Master's Theses. 282. The College at Brockport*.
- Darrel, M. (2005). *The howard street tutoring manual: Teaching at-risk readers in the primary grade*. Guilford Press.

- David Fulton. Denzin, N & Lincoln, Y. (2005). *The SAGE handbook of qualitative research*. Sage Publications, Inc.
- Davin, R. & Van Staden, C. (2005). *The reception year: Learning through play*. Heinemann.
- Davis, F. D. (2011). *Foreword in technology acceptance in education: Research and issues*. Sense Publishers.
- De Vos, A.S, Strydom, H, Fouche, C.B. and Delport, C.S. (2003). *Research at grassroots: for the Social Sciences and Human Service Professions*. Pretoria:Van Schaik.
- Dev, P. C., Doyle, B. A. & Valente, B. (2012). Labels needn't stick: "At-risk" first graders rescued with appropriate intervention. *Journal of education for pupils at Risk*, 7(13), 327-329.
- Dewey, J., (1966). *My pedagogic creed; Lectures in the philosophy of education*. Random House, NY.
- Donnell, W.J. (2007). The Effects of multi-sensory vowel instruction during words study for third-grade pupils. *Reading Research Quarterly*, 42 (4). 468-471.
- Elwér, A. (2014). Early predictors of reading comprehension difficulties. *Linköping Studies in Behavioral Science*. 1(1), 186.
- Ehri, L.C., Nunes, S.R., Stahl., S.A., & Willow, D.M. (2001). Systematic phonics instructions help pupils learn to read: Evidence from the National Reading Panel's Meta-analysis *Review of Educational Research*, 71,393-395
- Emmanuel, U. I. (2013). *Effect of concentrated language encounter method in developing sight word recognition skills in primary school pupils in Cross River State*.
- Ferrer, E., Shaywitz, B.A., Holaham, J.M., Marchione, K.E., Michaels, R., & Shaywitz, S.E (2015). Achievement gap in reading is present as early as first grade and persists through adolescence. *The Journal of Pediatrics*, 167 (5), 1121
- Fletcher, J.M., Lyon, G.R., Fuchs, L.S., & Barnes, M.A. (2007). *Learning Disabilities: from identification to intervention*. The Gudiford Press.
- Giess, S. (2005). *"The Effectiveness of a multi-sensory, Orton-Gillingham influenced approach to reading intervention for high school pupils with reading disability"*. Ph.D. Thesis. The University of Florida.
- Goswani, U. (2010). *Sensory theories of developmental dyslexia: three challenges for research*: Centre for Neuroscience in Education.
- Guardiola, J. G. (2001). *The evolution of research on dyslexia, Institute for behavioral genetics and Department of Psychology*. University of Colorado, Boulder, CO, EEUU. 32(1):3-30.
- Huitt, W. G. (2000). *A constructivist approach to learning [PowerPoint]*. CA: Valdosta State University
- Gumut, V. K. (2023). *Reading and reading Disabilities*. EDSL 844 course lecture notes. Unpublished article. University of Jos.

- Gwanshak, N.A. & Zaram, G.G. (2017). Effects of picture book on reading performance of pupils with learning disabilities. *Journal of Special Needs Education and Rehabilitation Science*. 1 (2), 88-89
- Haboush (2010). *The effectiveness of using a programme based on multiple intelligence theory on English graders, English reading comprehension skills*. M.A Theses: Islamic university of Gaza. Available: elibrary.iugaza.edu.ps
- Harvey, S. & Goudvis, A. (2008). *The primary comprehension toolkit: language and lesson for active literacy*. Teacher's guide. Heinemann
- Individual with Disabilities Education Act, (2004). *Special Education Policy*. Child-testing.com.
- International Dyslexia Association (IDA), (2003). *What is dyslexia?* Bright Solutions for Dyslexia. Retrieved 1-8-2019 from: www.dys.add.com/define.html
- International Dyslexia Association (IDA), (2007). *Framework for informed reading and language instruction: matrix of multi-sensory structured language program*. <https://www.interdys.org>
- International Dyslexia Association (IDA), (2017). *Universal screening: k-2 reading*. (Fact sheet) Retrieved from: <https://dyslexia.org/universal-screening-k-2-reading/>
- Individuals with Disability Education Act (IDEA) (2004). *U.S Department of Education*. Retrieved from <https://www.ed.gov>.7 IDEA. 08/09/2023
- Johan, A., William & Sharon, Lynch, A. (2010). *Dyslexia: What teachers need to know*. *Kappa Delta Pi Record* 46, 66-70.
- Kathrine, J. P. (2009). The importance of evaluation research. *Journal of experiential education*. 31; 390-394
- Kirby, A., Davies, R., & Bryant, A. (2005). Do teachers know more about specific learning difficulties than general practitioners? *British Journal of Special Education*. 32, 122-126.
- KokHwee, N.C., Houghton, S. (2011). *The effectiveness of Orton-Gillingham-based instruction with Singaporean children with specific reading disability*. First published: 12 October 2011 <https://doi.org/10.1111/j.1467-8578.2011.00510.x>
- Korkmaz, S. C. & Karatepe, C. (2018). The impact of multi-sensory language teaching on young English learners' achievement in reading skills. *Novitas-ROYAL Research on Youth and Language*, 12(2), 80-95.
- Labat, H., Vallet, G., Magnan, A., & Ecalle, J. (2015). Facilitating effects of multi-sensory letter encoding on reading and spelling in 5-year old children. *Applied Cognitive Psychology*, 29, 381-383.
- Learning Disabilities Association of America, (2005). *Learning Disabilities: Signs, Symptoms and Strategies*: <https://idaamerica.org/support/new-to-id/>
- Lee, F. (2009). *Teachers' perceptions of pupils with dyslexia in a local primary school (Diss.)*. The University of Hong Kong.

- Lyon, R., Shaywitz, S., & Shaywitz, B. (2003). Defining dyslexia, comorbidity, teachers' knowledge of language and reading. *Annals of Dyslexia*, 53.
- Magpuri- Lavell, T., Paige D., Williams, R., Akins, K & Cameroon, M. (2012). *The effects of a summer reading programme using simultaneous multi-sensory instruction on language arts on reading proficiency*. Reading improvement: <https://lcb.gcsu.edu/eds>.
- Mogbel, A.K. (2019). Effectiveness of a program based on a multi-sensory strategy in developing visual perception of primary school learners with learning disabilities: A Contextual Study of Arabic Learners. *International Journal of Education Psychology*, 8; 72-104.
- Moustafa, A., & Ghani, M. Z. (2016). *The effectiveness of a multi-sensory approach in improving letter-sound correspondence among mild intellectual disabled pupils in State of Kuwait*.
- National Assessment of Educational Progress, (2007). *The Nation's Report Card*. <https://nces.ed.gov/nationsreportcard/>
- Natoli, C. (2011). *The importance of audio-visual materials in teaching and learning*. www.helium.com/channels/224-early-childhood-edu.
- Nourbakhsh, S., Manner, S., Baba, M., & Madan, Z. (2013). The effects of multi-sensory method and cognitive skills training on perceptual performance and reading ability among dyslexic pupils in Iran. *International Journal of Psychological Studies*, 5 (2)
- Obaid, M.A.S. (2013). The impact of using multi-sensory approach for teaching pupils with learning disabilities. *Journal of International Education Research*, 9(1), 34-51.
- Ozegya, A. E. (2015). *Effects of student and teaching activity reading text (START) on reading comprehension of pupils with learning impairment*. Unpublished Doctoral Thesis, University of Jos.
- Ozaji, D.E., Unwachukwu G.C., & Kolo I.D. (2016). *Modern trends and practices in special education*. Foremost education services ltd.
- Rasiniki, T.V., & Pandak, N. (2000). Effective reading strategies: teaching children who find reading difficult. (2nd ed.): Merrill/Prentice Hill.
- Sanders, M. (2001). *Understanding dyslexia and the reading process: A guide for educators and parents*: Allyn and Bacon.
- Snowling M.I. & Stackhouse, J. (2006). *Dyslexia speech and language: a practitioner's handbook* (2nd ed). John Wiley & sons.
- Syahputri D. (2019). The effects of multi-sensory teaching method on the student's reading achievement. *Journal of Linguistics and Education*. 2(1),124-131
- Umolu, J. & Mallam, W. A. (2006). *Use of an informal reading inventory for reading assessment of Nigerian primary school children*.
- Umolu, J. (2017). *Literacy and reading in Nigeria*. researchgate.net
- United Nations convention on the rights of the child. (1990). UN.: <http://www2.ohchr.org/english/law/crc.htm>

WHO. (2011). *World Report on Disability*. World Health Organisation. Collected:
http://www.who.int/disabilities/world_report/2011/en/index.htm