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Supporting a graphic design dyslexic student: Utilizing multimedia tools and design applications

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Abstract: Dyslexia is a learning condition that affects both children and adults, limiting their ability to read, write, and spell. This case study focuses on Simon, a high-achieving student at a Lebanese private university who struggles in English language classes due to dyslexia. The purpose of this study is to examine how targeted interventions can improve his spelling skills and overall learning experience. The design combines a case study framework with mixed methods. The methodology integrates both qualitative and quantitative approaches, while the approach is inquiry-based and learner-centered. The study emphasizes the importance of phonological awareness in addressing these issues, exploring how a lack of it hinders the acquisition of basic skills. The current research examines the psychological and social effects of dyslexia on individuals, highlighting the importance of supportive learning environments. It utilizes multimedia-based learning procedures customized to Simon's design interests. Specifically, the study used high-frequency word repetition and video-based exercises to improve his spelling skills and foster autonomous learning. The findings demonstrate measurable improvement, showing that Simon's ability to accurately spell high-frequency words improved significantly, implying that multimedia tools can help dyslexic adults learn. In conclusion, practical implications suggest that adopting such a model incorporating multimedia tools can be of high value for dyslexic learners.

Keywords: *Acquisition, Dyslexia, Phonological awareness, Qualitative, Quantitative.*

1. Introduction

Dyslexia, which is often underestimated, is a lifelong condition that affects millions of children and adults worldwide. Based on the observations of qualified doctors and some scientific studies, dyslexia is not limited to a specific life stage, such as the period of academic education. Instead, it remains a problem that affects individuals throughout their lives [1].

In simple terms, dyslexia is a barrier to a person's cognitive development as it impacts an individual's ability to read, write, comprehend, and even spell [2]. In a simultaneous situation, imagine trying to interpret a code in which the letters and words seem to constantly rearrange themselves, making reading a perplexing challenge, as it typically occurs in the mind of a person with dyslexia. According to recent studies, dyslexia is defined as a neurological condition that affects language processing, and it is highly heritable and displays polygenic transmission. Likewise, adult neuroimaging studies have found structural, functional, and physiological changes in the parieto-occipital and occipito-temporal regions, and in the inferior frontal gyrus, in adults with dyslexia [3]. While it may sound complex, at its core, dyslexia is about the brain's unique way of interpreting written information. For adults with dyslexia, this can lead to frustration, anxiety, and a sense of being held back in a world that demands strong literacy skills [4].

Conversely, many studies have asserted that dyslexia does not affect intelligence levels or adults' potential [2]. Many researchers have confirmed that individuals with dyslexia often possess above-

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average intelligence and are capable of maintaining academic performance appropriate for their age. However, they still experience fundamental reading difficulties during adulthood. It has been suggested that this achievement is likely due to their greater effort and the utilization of other cognitive skills [5].

In this scheme, dyslexia appears as a Learning Disability (LD) that can be diagnosed at a young age, mainly when children are first introduced to early sounds through recognition of characteristics such as "difficulty associating sounds with letters, reading dysfluencies, spelling difficulties, challenges with written expression, and poor handwriting" [6]. Yet dyslexia often goes undiagnosed until later in a child's academic journey [7]. Furthermore, in some cases where dyslexia is diagnosed earlier, insufficient attention or intervention is provided, particularly when it coexists with other comorbid learning disabilities. This delay in diagnosis and inadequate treatment can significantly affect a child's educational and emotional development [8].

In recent years, the incorporation of multimedia tools and technology has shown promise in assisting dyslexic learners, particularly in fields such as graphic design, where visual engagement is an important element of the learning process. Multimedia, such as video lessons, interactive design tools, and audiovisual feedback, can improve comprehension and retention of knowledge, making learning more accessible and less intimidating for students with dyslexia [9, 10]. According to research, multimedia technologies not only adapt to various learning styles but also enable individualized learning experiences that correspond with the interests and strengths of dyslexic individuals, such as those studying graphic design [11].

In this article, we will explore the topic of dyslexia in adults more thoroughly, focusing on a unique case involving a student at a private Lebanese university.

Upon closer examination of the student's exam papers, it became evident that his primary challenge lies in the realm of phonology. This revelation raises important questions about the role of phonological processing in dyslexia, particularly in adults who may have developed compensatory strategies to mask their difficulties. In the following sections, we will explore the student's journey in our study, the approach we adopted to assist in resolving his deficit, and potential strategies to support individuals like him in overcoming their academic hurdles.

1.1. Statement of the Problem

Adults with dyslexia face challenges in recognizing and becoming familiar with words, which can be linguistically characterized as challenges in phonology and morphology. According to Bogdanowicz et al. [12], not only do dyslexic adults make more spelling and/or punctuation errors, but they also tend to misuse pronouns, make lexical errors, and make more lexical and morphological errors, as well as more word structure errors during essay writing. They also have deficits in phonological short-term memory, phonological awareness, rapid automatic naming, visual perception and control, and visual-motor coordination [12]. That was evident in the case of the student, who struggled with high-frequency words, basic word recognition, and sight words in his written exams.

In an interview, the student explained that he feels tired when asked to read, stressing that his LD hinders his reading and language proficiency. He tried to explain that while reading, he sees the letters differently, as if scrambled or jumbled, so he ends up surrendering to the requirements and haphazardly circling choices in multiple-choice questions, for instance. What the student revealed was similar to an asserted finding done by San Jose, which shows two of five dyslexic adult learners who reported letter movement when reading [8].

1.2. Purpose of the Study

To address the student's problem, we aim to investigate whether actively involving the student in creating videos featuring high-frequency words and sight words can serve as an effective intervention to enhance his word recognition skills and improve his familiarity with these words. This study aims to understand the potential benefits of multimedia engagement tailored to students' needs and preferences in overcoming specific language-related difficulties. One of the prominent goals of this study is to

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support students with dyslexia and offer students a practical approach through building autonomous learners who are ready to seek knowledge with little or no help while practicing a learning method or activity that suits their preferences.

1.3. Hypothesis 1

Creating videos that showcase high-frequency words and sight words will enhance word recognition and increase familiarity. By actively engaging with the words in a multimedia context that he has a hand in crafting, we anticipate significant improvements in the student's ability to recognize, remember, and effectively use these words, contributing to his overall reading and language skills.

1.4. Hypothesis 2

Integrating multimedia tools and design applications as components of a personalized intervention program will result in sustained and substantial improvements in the reading and language skills of adult learners with dyslexia.

1.5. Hypothesis 3

Allowing dyslexic students to work independently on a variety of tasks will positively impact their self-learning abilities and foster greater autonomy in their academic pursuits.

2. Literature Review

Dyslexia is not only associated with childhood but also develops in adults [13]. Undheim confirmed this statement through a 13-year study in which 75 students diagnosed with dyslexia at age 10 were screened again at age 16 and at age 23. The results indicated that almost all the students continued to experience dyslexia and exhibited reduced decoding abilities. However, as young adults, they achieved an educational level not much lower than their peers. This supports the statistic that approximately 4% of the adult population suffers from dyslexia [3], and the numbers are still increasing as awareness of this learning difficulty has become greater.

As a result of the significant effects of dyslexia on children and adults, developmental dyslexia has become a major concern for linguists, educational psychologists, neurologists, optometrists, and educators [7].

The most recent studies have identified dyslexia as a hereditary defect in temporal processing, associated with impaired development of magnocellular neurons, which selectively affect the ability to learn to read, leaving verbal and nonverbal reasoning powers intact [6, 7]. It is also associated with impairments in some neuropsychological functions, including working memory and information processing speed [14].

Sigurdardottir et al. [15] explained dyslexia from an optometric point of view, saying that the difficulty that people with dyslexia have in reading may be manifested in higher-level visual deficits, as people with dyslexia may simply tend to be at the lower end of the normal range of object perception abilities, where they can recognize objects and shapes but not words. This would also explain the reason many dyslexics paint or draw professionally, even though the prevalence of dyslexia has been reported to be particularly high among art students [15].

Although this disorder varies among individuals, common characteristics among dyslexic people include difficulty with phonological skills, decreased accuracy and fluency in reading and vocabulary, poor spelling, and/or poor rapid visual and verbal responses [6, 8]. Unfortunately, these difficulties and mispronunciations of words have emerged as common embarrassing linguistic incidents among people with dyslexia [8], affecting their self-esteem and socioemotional functioning, such as anxiety and depression, leading to higher rates of school avoidance or dropout, as well as functional and adaptive deficiencies throughout life, even while working [14]. Studies have shown that individuals with dyslexia are at increased risk for anxiety, depression, and other psychological symptoms [14].

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On the other hand, many adults with dyslexia have gained optimism and found various coping mechanisms that include reading forward, encouraging oneself, studying harder, socializing, asking for help from classmates and professors, practicing, and referring to websites [8]. At the university level, MacCullagh et al. [16] found that more than 35% of students with dyslexia (5 out of 13) reported that they found their online videos to replace or supplement assigned readings. One dyslexic student said during an interview: "I YouTubed quite a few things from the lectures and textbook that I still didn't understand, and I found videos that explained it with pictures, and it stuck in my mind a lot quicker" [16].

In attempts to find the best way to overcome the difficulties of dyslexia, some research was conducted on different mechanisms, concentrating mainly on multimedia, videos, sight words, and personalized experiences. Abtahi [17] found that learning with Interactive Multimedia Learning Object (IMLO), which was developed to teach "multiplication of two" amongst dyslexic children, was motivating, fun, and easy, and helped children to understand the topic better as the content was broken down into small steps, allowing dyslexic children to perform the task in a short time, and leading them to learn better [17].

Another study conducted by Borhan et al. [18] tested the impact of the mobile app, Mr. Read V2.0, which uses a sight word reading strategy to help children with dyslexia build their reading skills. Children's test scores improved by 28%, showing that a sight word reading strategy integrated into mobile apps is an effective way to help children with dyslexia improve their reading skills [18].

According to Moreno and Mayer [19], students who receive personalized messages are more likely to achieve a deep understanding than students who receive non-personalized messages, as encoding the lesson as a personal experience activates the subjective structure and makes experiences available in memory to which the lesson can be associated. They added that in multimedia learning, using animation, students who received scientific explanations through text or narration combined with animation performed better on retention tests than students who received only text or narration alone [19].

Finally, all the above highlights the importance of dyslexia assessments to guide professionals in finding practical and efficient solutions. Although the unique nature of dyslexia and its presentation vary between individuals, it is important to understand as much as possible and stay well-informed about the available assessment and intervention strategies to help reduce the long-term effects of dyslexia [6].

3. Methodology

To understand the effect of incorporating multimedia tools and design applications as part of a tailored intervention program to help adult learners with dyslexia, this research will use both qualitative and quantitative approaches to inquiry. Qualitative research provides a rich and deeper understanding of information and allows for this research type to examine the participants' reactions and interactions with the learning approach. On the other hand, quantitative approaches will provide an in-depth analysis of the pre- and post-assessment results of the participants' progress. As indicated earlier, both approaches help with understanding the purpose of the study. More specifically, this research uses quantitative analysis with inductive coding schemes. Induction is the most suitable type of reasoning in such a study since it is the process of reasoning that goes from particular to general, by which the results will be interpreted from the pre- and post-tests to reach a general premise. The qualitative part deals with the students' reactions during the learning process and the videos they are going to create. Studying the elements and features of the videos will provide valuable insights into assessing the students' progress throughout the study. As monitoring the students' reactions and their instant feedback is considered a subjective evaluation, a deeper study of the results will be tackled quantitatively using the Woodcock-Johnson Tests of Achievement - III (WJ-III), which includes a spelling subtest that can be administered both before and after an intervention to quantify changes in spelling proficiency.

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3.1. The Style of Research: Case Study

In general terms, a case study is a reliable and detailed research method used to examine and analyze a phenomenon, individual, or topic. Used in many fields, including but not limited to business, sociology, and education, this tool aids in acquiring precise and extensive data about the subject of analysis, Crowe and Sarma [20], which in our case is a dyslexic student [20].

Furthermore, case studies consist of a methodical analysis of relevant subjects to better comprehend their cases. After analyzing and interpreting the results, the case study approach offers a platform for formulating practical solutions to address identified challenges [20].

The case study in this paper requires a comprehensive description of the dyslexic student's educational background, as well as relevant situations or any existing problems. This research will employ a dual-method approach encompassing both qualitative and quantitative methodologies. For the qualitative approach, words that the participant has written will be collected and interpreted to find recurring patterns related to the problem; however, the quantitative method will focus on numerical data to draw conclusions. Gathering and analyzing the participants' input through a case study provides insight into the thought processes, making them important for resolving the situation at hand. In short, a case study is used to obtain accurate, in-depth, and objective results about a specific case [21].

3.2. Participant

In this article, we will explore the topic of dyslexia in adults, focusing on a specific case of a student at a Lebanese private university. The student, named Simon, has a high GPA of 3.19 as of Summer 2023. He demonstrates exceptional social intelligence and excels in various academic areas, particularly in Multimedia and Design. Despite his academic success, Simon faces ongoing challenges in his English remedial courses and English language support courses, often struggling with fundamental concepts.

Simon's situation became even more intriguing when he expressed frustration over his most recent failing grade, stating, "If you had read the questions, I would have answered most of the multiple-choice questions." This complaint prompted a deeper investigation into his case, as it hinted at underlying issues beyond mere comprehension difficulties.

Upon closer examination of Simon's exam papers, it became evident that his primary challenge lies in the field of phonology. This revelation raises important questions about the role of phonological processing in dyslexia, particularly in adults who may have developed compensatory strategies to mask their difficulties. In the following sections, we will explore Simon's journey in our study, the approach we adopted to assist in resolving his deficit, and potential strategies to support individuals like him in overcoming their academic hurdles.

In one of the meetings with the participant, key insights were shared that proved instrumental in shaping the ongoing process. At the age of 6 months, the participant underwent open-heart surgery and contracted a brain infection during the procedure, which may have contributed to brain damage. Furthermore, a hot towel was inadvertently placed under his head during the surgery, resulting in a lasting burn on his lower skull. The parents only discovered this burn later, and the participant endured a protracted recovery process from the pain.

On a separate note, Simon often found himself subject to comparisons with his siblings and even his cousins, which underscores the impact of dyslexia on social acceptance and self-perception. Multiple studies on the relationship between dyslexia and psychosocial functioning show that dyslexics exhibit low self-esteem and more psychological and behavioral disorders compared to individuals without any learning disorders [22]. In one of the meetings, Simon detailed that he doesn't find a justification for some sounds in English; he humorously clarified why "ph" is pronounced F in pharmacy or why "K" is silent in Knife. He simply stated that such sounds feel nonsensical and make reading and spelling words harder.

Simon also stated clearly that when it comes to writing and reading words, he tends to forget a lot, though from the stories he shared during our meetings, we can infer that he has no short-term memory symptoms at all, yet a structured flow of information.

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Finally, Simon disclosed that his parents attributed his developmental delay to being excessively pampered, highlighting the possibility that parents may sometimes be in a state of denial when confronting their dyslexic child's challenges. In a spontaneous reaction at the end of the meeting, Simon conveyed, "I learned how to cope with this difficulty, and I also learned not to dwell on or concern myself with negative judgments."

3.3. Learning Environment

The learning environment is significant for this study as it is responsible for providing a conducive workspace for dyslexic students, which helps them perform better. Many studies conducted on the purpose of the learning environment have revealed a constructive and positive link between the environment itself and the learning objectives [23].

3.4. Plan and Execution

There are different ways to help dyslexic children improve their reading skills, such as repeated reading, sight word drills, and syllable examples [18]. In particular, sight words provide a fantastic foundation for reading [18, 24]. The child [adult] processes varied contexts more efficiently when the word appears more frequently. High semantic variety is associated with faster and more accurate reading, highlighting the importance of diverse exposure in word learning [25]. This strategy of consistent exposure to high-frequency and sight words will be followed and applied to Simon's learning process. The participant takes multiple courses to strengthen and enhance his English writing and speaking skills. He is enrolled in English to Support and English Academic Writing at a higher education institution in Lebanon, where he works hard despite his dyslexia. Along with the coursework, Simon attends regular weekly visits to sit for tests, whose data will be collected for the study. Simon has to sit for weekly tests that involve writing high-frequency and common words such as 'sure', 'here', and 'young', upon hearing them from the instructor and without the latter's interference. Furthermore, it is essential to note that the words are presented in meaningful but concise sentences to avoid confusion with their potential homophones. The phonological structure of the words written will be analyzed and interpreted to track the possible progress from one week to the next. To strengthen the retention of the same words and familiarize Simon with them, he is tasked with creating a video utilizing multimedia and digital tools. This task not only aligns with his interests but also leverages his expertise, acquired through his graphic design major. The gathered data and analyses will reveal whether the digital approach has helped create an autonomous learner who is able, in the long run, to understand and write the learned words correctly in different contexts.

3.5. Data collection (Videos- Assessments)

The data collection process for this study comprised two main components. The initial focus was on pre- and post-assessment outcomes, involving a series of weekly tasks assigned to the participant. These tasks involved creating videos showcasing up to 10 high-frequency and sight words. Before initiating each video task, a spelling test was administered that covered the designated set of words. Importantly, there was no undue pressure on the participant, as we deliberately refrained from setting strict deadlines or rushing the creative process. This approach aimed to ensure an organic learning experience, free from external pressures.

Following the creation of each video, an unplanned post-assessment was conducted during a surprise visit. This approach was chosen to assess the participants' understanding without allowing for memorization or preparedness.

The study commenced with a pilot phase, during which the participant created a video without vocalizing the words. However, recognizing the importance of reinforcing reading skills, we suggested that the participant incorporate word reading into the videos. The initial group included five words. Encouraged by the success of the pilot study and the participants' sustained interest, we progressively increased the number of words to ten, fifteen, and twenty.

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The study spanned approximately six months, from 12 October 2023 to 19 April 2024, during which the participant underwent pre- and post-assessments on a weekly or biweekly basis. Over this period, the participant created up to 10 videos, each featuring distinct features and designs. Notably, the participant exhibited a keen interest in the visual presentation of words within the videos. This variable encouraged us to keep motivating the participant to design using different fonts and backgrounds, in which he would assimilate the shape of the word and the sequence of its letters and sounds.

The second component, encompassing a qualitative approach, focuses on the participant's academic progress in other university subjects and examinations. For instance, when tasked with writing or solving questions that indirectly incorporated the specified high-frequency and sight words, the administration provided the researchers with access to relevant exam papers. This allowed us to gain insights into the participants' application and integration of the studied words across diverse academic contexts.

3.6. Ethics Statements

The rights, dignity, and welfare of the participants involved in this study were fully respected and protected in accordance with established ethical guidelines for research involving human subjects. Before participation, the individual and their parents were informed of the nature and scope of the study and provided their verbal consent to participate in front of the student affairs representative at the university. To ensure privacy and confidentiality, a pseudonym ("Simon") was assigned and used consistently throughout the study. The participant was made aware of this and agreed to the use of the pseudonym in all related documentation and reporting.

No identifying information or sensitive personal data were collected, stored, or disclosed at any stage of the research. As such, full ethical approval was not sought, as the study did not involve sensitive topics, vulnerable populations, or potential risks to the participant. Additionally, the research was initially conducted as part of an internal academic exploration and was not intended for publication at the time. Therefore, Institutional Review Board (IRB) approval was not obtained at the outset.

The authors affirm that all procedures adhered to the ethical norms and standards typically expected for qualitative research in educational and behavioral contexts. Moreover, the authors declare that there are no financial interests or competing conflicts that could have influenced the research process or its outcomes.

4. Findings/Results

The results of this study show, in the pilot phase, a 40% progress in recognizing the sequence of letters in the first high group of high-frequency words (young, knew, others, hear, sure).

Table 1.
Group 1 – Results showing the pre- and post-assessments for the first group of words.

Young	0%	100%
Knew	100%	100%
Others	0%	100%
Hear	100%	100%
Sure	0%	0%
Progress in Percentage	40%	80%
Average of Progress	60%	

As indicated in Table 1, the participant showed a significant improvement in writing the words after creating the video, which demonstrates the effectiveness of the learning approach; however, the results could be more generalized in the second phase of the study, where the participant will be given larger groups of words accordingly.

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One of the study's purposes is to build an autonomous learner by tailoring the participant's areas of interest, primarily design, into creating a self-study method. This method would enable the participant to learn how to spell in his free time without any external pressures.

In the pre-assessment phase of the second group of words (Table 2), the learner made 36% progress, which increased to 73% later in the post-assessment.

Table 2.
Group 2- Results showing the pre- and post-assessments for the second group of words.

Down	100%	100%
These	0%	100%
Too	0%	100%
Little	0%	0%
Could	0%	0%
Where	0%	100%
People	100%	100%
More	100%	100%
Words	0%	0%
Make	100%	100%
Two	0%	100%
Progress in Percentage	36%	73%
Average of Progress	55%	

This further reveals that the video's preparation and execution have helped the learner tremendously. He was able to correctly spell the high-frequency words without re-watching the video he created.

Growth continues with the third group of words as progress is documented in Table 3.

Table 3.
Group 3-Results showing the pre- and post-assessments for the third group of words.

Bags	0%	100%
Pen	0%	100%
There	100%	100%
Which	0%	100%
Their	0%	100%
Big	0%	100%
Said	0%	0%
Each	0%	100%
Knew	100%	100%
Know	100%	100%
Called	0%	100%
When	100%	100%
Progress in Percentage	33%	92%
Average of Progress	63%	

Even with the increase in the number of high-frequency words, Simon, with the help of design applications, was able to write them accurately. Therefore, the average progress advances as the learner uses multimedia tools to help them in spelling. This proves that technology-based interventions yield beneficial outcomes in overcoming literacy problems, especially when the dyslexic learner shows great motivation and engagement with the digital learning tools [26]. It is worth mentioning that the slight drop in average progress from group 1 to group 2 may be linked to the larger word count. However, a remarkable growth is shown with a progress of 63% in the third group of high-frequency words, as seen in Table 3.

In addition, the administration provided the researchers with access to relevant exam papers that indicate the use of some of the learned high-frequency words. The results show that the accuracy level is

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notably higher in the exams where the participant utilized the learned high-frequency words. Specifically, the accuracy level in using these words in written responses increased from 45% in the initial phase to 85% by the end of the study, as seen in Table 4. The improved writing performance with fewer spelling errors is associated with the digital intervention, which promoted positive attitudes towards learning and improved executive function skills, such as the participant's working memory and cognitive flexibility [27].

Table 4.
Accuracy Level of High-Frequency Words in Exam Responses.

Exam Phase	Number of High-Frequency Words Used	Accuracy Level (%)
Initial Phase	10	45%
Post-Intervention	15	85%

This significant improvement underscores the effectiveness of the multimedia-based self-study approach, particularly in reinforcing the retention and accurate use of high-frequency words in academic settings.

5. Discussion

The participant's ability to apply these words in various contexts, beyond the controlled learning environment, suggests that the method adopts not just rote memorization but a deeper, more functional understanding of word usage. This is particularly evident in the comparison of pre- and post-intervention exam scores, as seen in tables 1, 2, and 3, where a marked increase in the use of correctly spelled high-frequency words directly correlates with an overall improvement in written communication skills.

The study also highlights the participants' growing autonomy in learning, as the need for external prompts diminished over time. By the third group of words, the participant demonstrated a near-independent capacity to identify and correct spelling errors, even without immediate feedback, indicating a shift toward self-regulation and internalized learning strategies. This autonomy was further supported by the participant's active engagement with design applications, which not only enhanced the learning process but also aligned with his interests, making the learning experience more meaningful and sustainable.

However, while the results are promising, the study acknowledges the need for further research to confirm these findings across a larger sample size and more diverse word sets. Future studies should also explore the long-term retention of spelling skills acquired through this multimedia approach, as well as the potential for scaling the method to different learner profiles and educational contexts. Additionally, examining the role of learner motivation and engagement in the success of multimedia tools could provide valuable insights for refining and optimizing the self-study model.

6. Conclusion

The pilot phase of this study demonstrates the potential of integrating multimedia tools and learner interests into spelling instruction, leading to substantial improvements in spelling accuracy and learner autonomy. The promising results from the pilot phase pave the way for broader applications of this approach, as shown in Table 4, offering a personalized and effective solution for learners struggling with high-frequency words.

7. Recommendations

There are several recommendations to make. First, future studies must utilize more primary data in assessing the effect of incorporating multimedia design in helping students with dyslexia. Additionally, future analyses should include a larger and more diverse sample of individuals to ensure the accuracy of the study outcomes; this is because the analysis in this research is used to produce reliable results that

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could be generalized only to specific adult dyslexic students studying Graphic Design at university or at least interested in multimedia fields. Lastly, the results of the qualitative research cannot be generalized since the sample is small, but the results could be applicable to students majoring in other fields who need help overcoming their dyslexia. This study could be reported in detail to enable future researchers to replicate the analysis and build on the achievements of this research.

8. Limitations

Based on the nature and findings of this research, we have provided an in-depth study of the collected data, but the results cannot be generalized because the study was conducted on one individual and not a large sample that would provide a wider range of interpretations.

To attain accurate results in future similar studies, this research paper could be replicated when analyzing other cases. It is imperative to mention certain limitations that this study encountered. There is a time limitation that permits viewing more details and wider segments since this method of teaching dyslexics may not apply to other students in similar contexts.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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