EXPLORING THE POTENTIAL OF AI TOOL MID JOURNEY) ON THE READING COMPREHENSION SKILLS OF PAKISTANI DYSLEXIC STUDENTS

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Abstract:
The current study aims to explore the efficiency of the AI tool (Mid Journey) for improving the reading comprehension skills of Pakistani dyslexic students. The literature revealed that the use of artificial intelligence is very instrumental in improving the learning experience of dyslexic students, as learning through conventional teaching makes their learning experience very challenging. This quasi experimental research employs pre- and post-assessment measures to evaluate the impact of this tool on the sample of purposefully selected fifteen dyslexic students for the study. The findings of the descriptive statistics as well as paired samples t- test revealed improvement in the performance of the students. The study revealed the potential of integrating the Mid Journey tool into the pedagogical practices for improving the English language reading comprehension skills of the dyslexic students. Additionally, parents and caretakers of these students can also benefit from similar AI tools while teaching them at home that would not only improve the academic performance of the students but also make them confident.

Key Words: Dyslexia, Reading Comprehension, ESL, AI, Mid-Journey Tool

Introduction:

Dyslexia is a neurodevelopmental disorder that affects an individual's ability to read, write, and comprehend the text where individuals with dyslexia seem vulnerable to socio-emotional issues that badly affect their self-esteem which may often result in the underperformance in academic achievement tests (Shaywitz & Shaywitz, 2020).

For dyslexic children, traditional teaching methods that solely rely on text- based material may not be appropriate, as they require specific learning environment that goes beyond the contemporary practices prevalent in the mainstream schools. On daily basis, English language teachers try their level best to explore unique ways to address the diverse learning needs of these students (Suresh Babu & Vinutha, 2024). The specific environment for teaching English to dyslexic children might include technological accommodations, visual displays, customized help, and sensory approaches (**Khasawneh, 2024**) that has often been found very beneficial in addressing their learning difficulties and improving their overall academic performance (Javed, Muniandy & Husni, 2024).

With the invasion of Artificial intelligence (AI), the field of English language teaching has also undergone a rapid transition especially when it comes to teaching dyslexic students (Gupta & Khan, 2023) because AI has the transformative power to create visually appealing images that may help these students comprehend and retain the information for a longer period of time especially in academic achievement tests (Minoofam, Bastanfard, & Keyvanpour, 2022).

The advancement of diffusion-based AI platforms has revolutionized the world by their remarkable capability to generate visually striking images based on simple text prompts (Silva et al., 2021). This breakthrough has made these platforms as valuable tools to

generate visually appealing designs of concepts in various disciplines that require creative visual design tasks. By offering visual representations of difficult topics, AI platform can aid the students in learning and make it simpler for people with dyslexia to understand and retain information (Ploennigs & Berger, 2022). The innovative and engaging features of AI can also improve the whole learning process by encouraging active participation and igniting the imagination of dyslexic children. In their study, Peters et al. (2019) systematically reviewed the effectiveness of visual images in improving dyslexic students' reading achievement and concluded that AI tools for generating visually appealing images have been found very instrumental in improving dyslexic students' reading fluency and comprehension. The AI generated images can target particular reading-related processes by focusing on visuo-attentional cues that enhance readers' overall skills (Zhang et al., 2023). The study by Vidyasagar (2019) revealed the connection between problems with reading comprehension and difficulties in visuo-spatial attention and suggested that visual appeal based on the text can trigger academic achievement of the students. In their study, Minoofam, Bastanfard, and Keyvanpour (2022) found Reinforcement Adaptive Learning Framework (RALF) very helpful for dyslexic students particularly in the case of teaching reading skills by using visuals because Visual attention span (VAS) activities have been found in correlation with reading skills of dyslexic students (Cirino et al., 2022). In essence, it shows how closely reading skills are related to VAS activities, as VAS is essentially the capacity to remember and recognize several visual details in a single glance and it refers to the ability to incorporate visual information of the text in the reading process. Reading comprehension skills can be better improved only when people can grasp and absorb more words because they have a longer visual attention span. This demonstrates the distinctive role that visual attention span plays in reading ability. Overall, the findings of the study emphasize the importance of visual attention span interventions for enhancing reading skills by developing strategies to process and retain visual information.

In the Pakistani perspective, the study carried out by Anjum and Mansoor (2020) argues that the two- week intervention of specifically designed computer assisted reading materials led to improvements of reading skills of dyslexic students as revealed by the findings of the study. In another study Anjum and Bhatti (2022) explored the potential of indigenously designed computer assisted reading materials for improving the reading skills of Pakistani dyslexic students and the findings of the study revealed that there was a marked improvement in the performance of the students before and after the intervention. These improvements are similar to the previous research studies that basically demonstrated that computer-assisted reading interventions are effective in improving the reading comprehension skills of dyslexic students. The results of the study revealed that computer - assisted reading materials created indigenously could improve the English language performance of Pakistani dyslexic students. The review of the literature suggests that the technology may be able to address the requirements and difficulties faced by dyslexic students while learning English language, as computer-assisted materials provide a distinctive and interesting method to teach English language by taking into consideration multimedia technologies that enhance students' learning experiences and language skills. Introducing multimedia elements and activities into the lesson plans of Pakistani dyslexic students would improve the conventional methods of instruction. The learning process would be improved only when the students are engaged with multiple senses, such as aural and visual, while learning English language (Khalid & Anjum, 2019). Technology only helps students learn when it is used in conjunction with conventional teaching techniques.

Dyslexic children in Pakistan have difficulties in their scholastic aspirations due to a lack of resources and support aids and the issues of reading comprehension have impeded their academic careers. In order to execute effective interventions that result in improvement in reading comprehension skills and empower people to successfully overcome obstacles, the current state of affairs needs to be seriously addressed. Therefore, it's essential to include innovative AI tools like Mid journey to make the learning experience of the students successful and the usage of these tools in the classroom can help students better understand written information through its visual representation.

The study's main objective is to explore the potential of AI tool, Mid Journey, to improve reading comprehension of dyslexic students in Pakistan. This study adds to the existing knowledge of literature on the potential of using AI tools for teaching English language to dyslexic students in the Pakistani perspective. The findings of the study can be used for further research into the educational requirements of dyslexic students in Pakistan on the one hand and the development of effective tailor based intervention plans for the dyslexic students on the other hand. The study attempts to address the question "Does Mid-Journey tool enhance the reading comprehension skills of Pakistani dyslexic students?"

Methodology:

The quasi-experimental research design uses non-randomized intervention studies which are highly used in the field of social sciences particularly for investigating the effectiveness of a new approach or program when it is used as an intervention (White & Sabarwal, 2014). The quasi-experimental research design was used in the present study, as the participants were not randomly selected but through purposive sampling technique. The quasi experimental research design was preferred to explore the potential of the AI tool, Mid Journey, in improving the reading comprehension skills of Pakistani dyslexic students of grade VI. The present study was conducted in a private sector high school located in LDA avenue, Lahore. A total of 17 dyslexic students were initially identified for potential inclusion in the research study. These students were selected on the basis of fulfilling the dyslexic criteria where they were screened for dyslexia through dyslexia screening checklist validated for Pakistani middle school level students (Ashraf & Najam, 2014). However, two students were not given permission from their families to be part of this study and the final sample comprised 15 students. The purposive sampling technique was used in this research which ensures that the sample was selected on the basis of specific criteria.

Theoretical framework:

The cognitive theory of multimedia learning (CTML) proposed by Mayer (2005) guides the current study. The theory states that multimedia supports the way, the human brain learns. Theory asserts that people learn more deeply from words and pictures than from words alone …..commonly known as multimedia principle. Learning through multimedia is best when we build mental representations of the words in the form of pictures (Mayer, 2005). The significance of CTML for dyslexic children highlights the importance of applying visual elements to improve the language learning skills, as dyslexic children often experience difficulties in reading and comprehending written text. The primary objective of CTML is to provide cognitive support in retaining information especially of dyslexic students. Visualization of the information may assist these students to make a link between prior knowledge and in building mental image of the given information, as it assists in breaking the complex pieces of information into smaller units that becomes very easy to remember. In the context of dyslexia, the Mid journey tool can provide dyslexic children with additional support in comprehending the content. The generated images can strengthen their understanding and create connections between text and visuals. Research has shown

that the modality and redundancy effects in both typical and atypical children have been found contradictory due to the differences in knowledge gains and use of specific tasks (Knoop-van Campen,Segers, & Verhoeven, 2019). The study conducted by Dawson et al. (2021), highlights the importance of CTML and shows how multimedia elements can be used to optimize learning outcomes. With respect to multimedia learning, sensory information enters through the visual channels and moves to sensory memory and then this information is transferred to working memory for active cognitive processing. Then from the working memory, that information is transformed into a coherent cognitive schema. The scope of the study is narrowed down to visuals and the study takes into account the image generator apps of AI and for this purpose, Mid-Journey tool is taken in order to create visual content for students.

Development of Reading Comprehension Material:

The reading comprehension materials were taken from the Punjab Textbook Board's sixth grade English book. The criteria for selecting a particular comprehension were based on two reasons: firstly, comprehension was perceived to be difficult among students, as identified by instructors or teachers and secondly, the challenging vocabulary of the lessons led to poor performance.

Research Procedure:

The pretest acts as assessment criteria for the initial reading comprehension abilities of dyslexic students. It provides a detailed analysis of their performance before the intervention. The reason to use written

comprehension exercises in a pretest is to ensure that the students understand their content. The questions at the end of comprehension assess and provide a quantitative degree of the students' pre-intervention comprehension skills.

After the pretest, the intervention lessons were prepared using AI tool Mid Journey. The intervention incorporated the visuals in form of generated images which were related to comprehension exercises. By providing visual cues, the aim is to facilitate reading comprehension. The posttest phase evaluated the effect of intervention by evaluating the reading abilities of students after their exposure with the intervention. The similar written comprehension exercises were used along with similar comprehension questions in order to ensure consistency with the pretest format.

Research Variables:

In the experimental study, the independent variable is considered as the factor that is used to determine its effect upon the dependent variable. On the other hand, the dependent variable is outcome that is observed, in order to establish the impact of independent variable. For this particular study, the independent variable is the teaching through intervention. The researcher had the control over how the tool was utilized and administered to students. The dependent variable on the hand, is the reading comprehension of the dyslexic students.

Ethical considerations:

To make sure ethical considerations were followed, detailed information regarding purpose of study was provided to the parents, and informed consent was sought for their child's voluntary participation. The researcher not only ensured the compliance to ethical standards of research but also due consideration was given to anonymity and the privacy of the students' data.

Analysis:

The quantitative data in the form of pretest and posttest scores of the students was analyzed through SPSS by using descriptive statistics and paired samples t- test with 5% probability level where the difference in the performance of the students can be seen in the form of mean

and standard deviation in the tables given below. Table 1 shows mean and standard deviation of the scores of students before the intervention.

Table 1: *Mean and Standard Deviation of Pretest Scores*
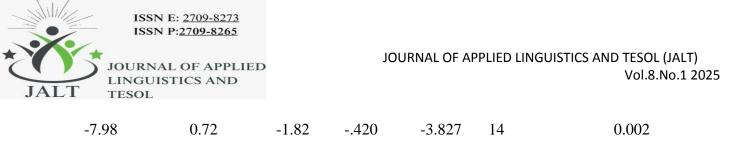
Mean	SD
5.28	1.68

From Table 1 can be seen that the students had shown very poor performance as revealed through 5.28 mean score with 1.68 standard deviation. Immediately after pretest, all the students underwent four weeks intervention period where they were taught through the developed materials. just after the intervention phase, the students appeared in the posttest and there can be observed clear difference in their performance as revealed by table 2 below.

Table 2: *Mean and Standard Deviation of Posttest Scores*

Mean	SD
8.68	0.78

Above table reveals the improved performance of the students with 8.68 mean score and 0.78 standard deviation that clearly shows the potential of AI tool (Mid Journey) in improving the reading comprehension skills of the students. In order to observe the statistically significant difference in the performance of the students before and after the intervention, the quantitative data was processed through paired sample t-test and the results can be seen in table 3 below.

Table 3: *Paired sample t test*

Mean	SD	95% Confidence Interval of the difference		T	df	Sig. (2-tailed)
		Lower	Upper			

-7.98	0.72	-1.82	-.420	-3.827	14	0.002

From the above table can be clearly seen the significant improvement in the performance of the students. From these findings, it can be assumed that the materials developed with the help of AI tool (Mid Journey) have the efficiency to improve the reading comprehension skills of Pakistani dyslexic students with $t(14) = -3.827$, $p = .002$, $\alpha = 0.05$. These findings suggest favorable impact of intervention on the reading comprehension skills of the students.

Conclusion:

The study concludes that English language teachers should adapt themselves according to the ongoing technological AI revolutions because the simple presence of technological infrastructure won't bring any change unless they normalize pedagogical skills according to the latest trends. Dyslexic students' four weeks exposure with the developed materials might have been fruitful for enhancing the reading comprehension skills of the students (Tariq & Naz, 2017). The findings are in favor of the usage of computer environment can be very fruitful in improving the academic performance of dyslexic students in Pakistan. The results of the study are also in line with the studies (Anjum and Mansoor, 2020; Anjum and Bhatti, 2022). Finally, the findings show that the AI tool (Mid Journey) is effective in improving reading comprehension skills of dyslexic students. Additionally, the research demonstrates the importance of visual attention in the reading comprehension skills of dyslexic students. The visual intervention provided by the Mid Journey tool played a crucial role in improving the students' reading skills. This emphasizes the significance of employing visual elements in order to facilitate the learning experience of dyslexic students. Taking into consideration the findings of this research, future research can be on the comparative analysis of the effectiveness of the image generator tools.

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