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Enhancing Writing Skills of Students with Dysgraphia by Creating a Friendly Classroom Environment at Primary Level in Private Sector in Khyber Pakhtunkhwa Pakistan

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Keywords	Abstract
Dysgraphia, Friendly Classroom Environment, Cursive Writing, Computer Typing Skills, Interactive Classroom Activities.	*The study emphasises that, despite technological advancements, handwriting is still important in everyday life, requiring complex skills such as fine motor coordination, visual-motor integration, and cognitive ability. Writing difficulties, such as dysgraphia, have an impact on both physical writing and composition. The study sought to investigate how a welcoming classroom climate can improve the writing abilities of primary kids with dysgraphia through research conducted in a private school. The goals were to identify kids with dysgraphia, investigate their challenges in written English, and provide instructional treatments. An experimental pre-test-post-test design was used to study dysgraphia in Grade 4 (9–10-year-old) private school students in the Peshawar district. A systematic sample of 70 students was selected, and 30 were identified with dysgraphia symptoms using a checklist. Pre-tests were used to conduct initial evaluations, and interactive activities and practice worksheets were provided to the experimental group to promote a supportive environment. Paired sample t-tests revealed considerable improvement in children who received tailored interventions in a welcoming environment. On the basis of findings, it is recommended that every student gain from the intervention and enable rapid modifications to instruction strategies; regular monitoring ought to be done. Students must benefit from a variety of learning strategies while using multiple teaching methods, such as kinaesthetic, visual, and technical aids, in order to adapt and maximize outcomes. Collaboration is required among the teachers who can help promote best practices and enhance writing abilities more broadly across classes by exchanging effective strategies and concepts. To improve intervention strategies, additional research is recommended to observe the variables affecting student performance variability, especially those with negligible or negative benefits.*

INTRODUCTION

Proficiency in writing is essential across various aspects of life. For students, handwriting remains a practical and accessible method for completing school assignments. In professional settings, writing is indispensable for tasks like drafting reports, resumes, memos, and other office-related documents (Guffey & Loewy, 2012). Dysgraphia encompasses a range of writing difficulties, including challenges with grammar, writing speed, letter comprehension, spelling, and writing style. For the criteria for therapies, different allegations can be seen, such as

problems in reading, finding the meaning of words, difficulties in identifying the expression of the words, and issues with mathematical expressions or grasping number sense. Gvion and Fridmann (2010) clearly defined “dysgraphia” by the Greek term “dys”, meaning "deficient", and the subsequent section "graphia", meaning “the act of forming letter shapes by hand”.

According to Harris and Graham (2014), writing serves as a fundamental tool for both learning and demonstrating one's acquired knowledge. Primary-level students at an early stage have problems in expression, specifically written expression, and this issue has been identified as dysgraphia, and this is one of the disabilities which have been the cause of hurdles in learning. Dysgraphia (a neurological condition in which someone has difficulty with writing for their age level) is a psychological term used for students having written or somehow hearing problems. It’s different from the other psychological disorders like ADHD (Attention-Deficit/Hyperactivity Disorder), dyscalculia (often abbreviated as DYSC), and dyspraxia (also known as DCD or Developmental Coordination Disorder). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), "affected learning capacities are considerably and significantly less than average for the student's chronological age and impede academic or occupational success, or daily activities, as evidenced by routine achievement assessments and comprehensive clinical evaluations." Though academic concerns develop over years of schooling, often they are not identified until later when the obstacles intensify (Gubbay & de Klerk, 2013).

Dysgraphia is a common learning difficulty that is often identified in students during the early stages of their education. Within the realm of basic skills discussed by educators in the classroom, students with dysgraphia may encounter challenges that lead to various learning difficulties (Reddy et al., 2022). Numerous studies have highlighted the specific types of instructional support that struggling readers and writers require to achieve success, as evidenced by research from the National Institute of Child Health Development (Pelatti & Piasta, 2017). Many children with dysgraphia face considerable difficulties when tasked with completing any writing assignment. The struggle to maintain correct spelling and produce legible handwriting can be highly disruptive, diverting attention away from the essential content of the assignment. The present study is enhancing the writing skills of students with dysgraphia by creating a friendly classroom environment at the primary level in the private sector: an experimental study.

Rationale of the Study

Writing is a complicated skill that requires physical, cognitive, and verbal abilities. The deficiencies in this area can impact the ability to effectively communicate thoughts and ideas through written language (Zain & Mumpuniarti, 2018). NCLD recognizes dysgraphia symptoms such as a tight grasp, poor posture, unreadable handwriting, reluctance to engage in writing or drawing activities, fatigue during writing tasks, verbalizing words while writing, and incomplete or missing words in sentences (Attitude Magazine, 2022). Ayar et al. (2022) examine the complexity and diversity of learning disabilities, emphasizing their origins in neurological differences and their impact on academic and functional skills. The study advocates for early identification and intervention tailored to individual needs, promoting a multidisciplinary approach to support individuals affected by these conditions. According to the study, thorough evaluations that take psychological and learning requirements into account are necessary to establish an appealing and productive primary school classroom with support services (Gary et al., 2023; Cataudella et al., 2021).

Significance of Study

The purpose of this study is to investigate the successful techniques for assisting students with dysgraphia through early detection and intervention. School counselors, instructors, and parents all play important roles in assisting these students in their academic learning. By providing evidence-based insights and practical recommendations, the study findings are a valuable tool for the educators, administrators, and policymakers in promoting learning environments for dysgraphia students. As the educational field progresses, the importance of this research lies in its ability to drive positive transformation and advocate for educational equity among children with varying learning requirements. This study aims to offer practical solutions for dysgraphia, ultimately reducing the occurrence of failures in practical life. This study will provide literature to the future research scholars.

Objectives of the Study

1. To examine the effect of strategies for creating a friendly classroom environment on students with dysgraphia.
2. To find out the difference between the outcomes of the pre-test and post-test of students with dysgraphia after treatment.

Hypotheses of the Study

H_O1: There is no significant effect of the friendly classroom environment strategies on students with dysgraphia.

Ho2: There is no significant difference between the outcomes of the pre-test and post-test of the experimental group with dysgraphia after treatment.

LITERATURE REVIEW

Writing is a complex skill that requires fine motor, visual-motor, cognitive, and phonological abilities, making it challenging for kids with learning impairments. Writing impairments, also known as dysgraphia, affect both physical writing and written expression, making it difficult for children to articulate their ideas. Because many academic tasks entail writing, dysgraphia can impact your overall performance. According to research, this illness affects anywhere from 4% to 20% of the population (McCloskey & Rapp, 2017). Early danger signs include unusual text structure, space, punctuation, and capitalization. Later, formatting, margins, and readability become problematic. Dysgraphia, which is usually misunderstood as incompetence or laziness, is a significant challenge for students, particularly when coexisting with dyslexia. Students with dysgraphia, like those with dyslexia, are frequently intensely aware of what they are not capable of in comparison to their classmates (Chung et al., 2020).

‘Dysgraphia’ and ‘specific disability in written expression' are titles used to identify those persons who, despite sufficient education, demonstrate writing abilities discordant with their mental and age levels (Chung et al. 2020). Yekeler et al. (2022) have stated that proficient handwriting is recognized as a significant factor in attaining academic success in the future. Students, especially those with high-incidence disabilities, may face challenges in producing text or composing limited content, encountering difficulties with content generation, vocabulary, and organising ideas (Chung et al., 2020).

Hebert et al. (2018) proposed several strategies to support students with dysgraphia, such as adjusting the pace and complexity of writing tasks, reducing the volume of writing required, and allowing additional time for completion. Suggestions included starting assignments early, utilising dictation or abbreviations, breaking down tasks into manageable phases, and limiting the amount of writing expected from students. Hcsuper (2022) observed that students could improve their ability to trace straight lines by modifying worksheets to include guiding lines, connecting dots to form shapes or geometric figures, and incorporating word recognition exercises. The use of shading techniques was also noted to aid students in developing pencil grasp and fine motor skills.

According to D'Entremont (2017), coloring exercises can improve motor abilities, muscular development, and hand-eye coordination, ultimately leading to better writing ability. Seyyedrezaei et al. (2023) did a study on visual-motor handwriting development in children that requires addressing both large and fine motor abilities to improve hand stability during writing activities, especially in schools that may not give appropriate help. According to Ye et al. (2023), dysgraphia is a neurological disorder that can impact individuals of all ages, including adults and children. These may be handwriting that is hard to read, varying letter sizes and shapes, insufficient alphabet formations, difficulties with communicating feelings through writing, unusual pencil grip, spelling mistakes, verbalizing words while writing, avoidance of drafting or writing tasks, missing words in sentences, grammatical mistakes, improper use of paper lines and spaces, and experiencing hand or arm discomfort.

Parents may be concerned about their child's learning difficulties, such as dysgraphia, and instructors should check for a learning impairment. There is a vital role of educational institutions in human life, particularly for children with special needs. Children with specific disabilities, such as speech difficulties, reading challenges (dyslexia), writing impairments (dysgraphia), and/or mathematical difficulties (dyscalculia), also require tailored education and assistance (Fletcher et al., 2018; Shaywitz, 2003). Dysgraphia, a writing difficulty, is characterised by underdeveloped neural connections in brain regions crucial for writing (Berninger, 2008). Children with dysgraphia struggle with the automatic motor sequences required for writing letters and numbers. Dyslexia, another learning disability, also presents with multiple symptoms, including motor movement difficulties, spelling recall issues, and problems expressing thoughts in writing (Chia & Ong, 2009).

Kinds of Dysgraphia

1. Dyslexic Dysgraphia: In dyslexic dysgraphia, an individual's spontaneous writing is impossible to read, yet copied text is more accurate; however, spelling remains significantly weak. Tapping the finger quickly is a usual technique for detecting fine motor problems. Dysgraphia may not necessarily imply dyslexia. Dysgraphia and dyslexia appear to be different; however, they may also occur together (Berninger & Richards, 2008; Berninger & Swanson, 1994).

2. Motor Dysgraphia: This has to do with poor coordination, low strength of the muscles, and a lack of fine motor abilities. Letter formation can be appropriate for very brief writing illustrations, but it takes a lot of work, too long to finish, and is not possible for a long time. Sometimes, slanted writing results from handling a pen or pencil excessively. Spelling skills are

not compromised. The finger tapping speed results are below average (Berninger & Richards, 2008).

3. Phonological Dysgraphia: The hallmarks of phonological dysgraphia are writing and spelling errors that impact the pronunciation of words that are unknown or uncommon, as well as phonetically irregular terms (Berninger & Richards, 2008).

4. Lexical Dysgraphia: A person with lexical dysgraphia can write, but they misspell unusual words using typical letter-to-sound patterns. This is more prevalent in languages like English and French that are less phonetic than Spanish (Berninger & Richards, 2008).

Handling Dysgraphia

Instructional strategies play a pivotal role in achieving the learning outcomes (Suwartono et al. 2019). It is important for the achievement of the objective that the instructional strategies be dynamic and modified according to the requirements of the individual or group of students' learning styles. However, these approaches can facilitate student learning and make the process more effective and engaging. Instructional strategies can help students learn by doing, avoiding monotony and contributing to their learning goals' success (Hayati et al., 2021; Bukowski, 1993).

According to Ediger (2002), the instructor should demonstrate legible handwriting first, and then the students should drill and practice following the model. Because the letter that the brain requests are frequently not the one that is retrieved and created, people with dysgraphia have difficulty recognizing letters (Richards, 1999). Enhancing fine motor abilities is a therapeutic strategy that has been scientifically proven to work. Better hand functioning can lead to improved handwriting by using exercises that strengthen the muscles used for fine motor activities (Richards, 1999). The second method for resolving handwriting problems is to use different approaches, including technology. Skipping such techniques is the way to solve the problem or compensate for it. These techniques were used by Keller (2001) in the organization she established to help dysgraphia pupils write more effectively. One of the speech-to-text techniques for the students with dysgraphia is to effectively support them. Free and user-friendly dictation tools like Google's voice typing, Dragon Dictation, and Apple's Speak Screen function can assist students in their writing tasks across all grades (Puranik & Li, 2022). Compared to disconnected print letters, cursive writing has fewer initial points, which results in faster writing, more uniform letter sizes, and a cleaner writing appearance overall (Puranik & Li, 2022). Students utilizing keyboards to practice writing is another strategy. Students in kindergarten are really interested in using such tools to study and have fun. This ability can be cultivated in a classroom setting. To help the student's developing typing abilities, numerous districts and schools provide typing programs (Puranik & Li, 2022). Students with dysgraphia can benefit from technology-based adaptations when it comes to writing tasks at all school levels. Numerous user-friendly, free speech-to-text dictation software are available. Students can use Dragon Dictation, Google's voice typing feature, in the Chrome browser (Puranik & Li, 2022).

Conceptual Framework

Creating a dysgraphia-friendly classroom requires both specialized interventions and active teacher assistance. Teaching cursive writing to increase speed and handwriting quality, as well as introducing typing abilities to pupils as early as kindergarten, can help them achieve

keyboard competence through regular practice and dedicated typing programs. Strategies which were used for students with dysgraphia are the independent variable, and the dependent variable is the students with dysgraphia whose writing skills were enhanced after treatment using the strategies.

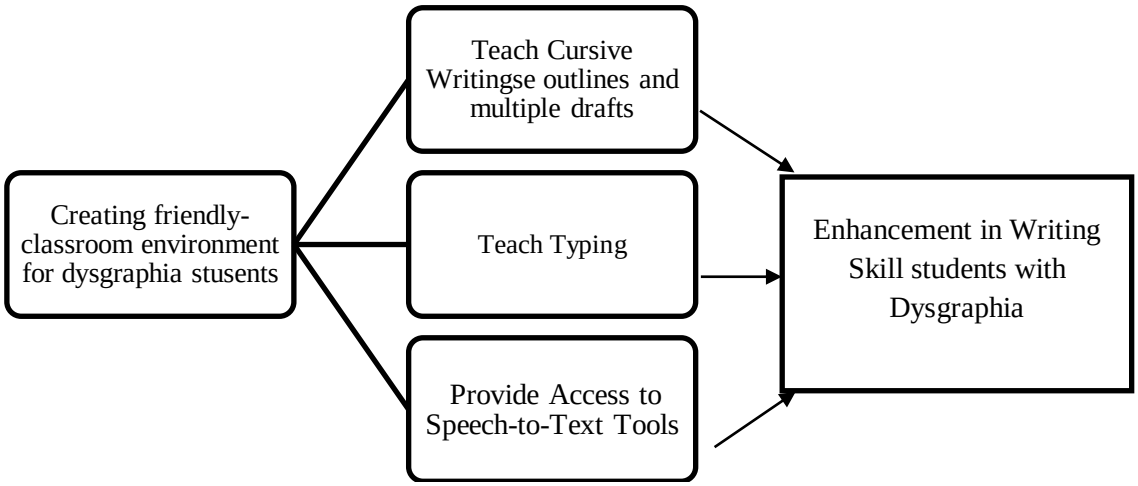

Figure 1: Conceptual Framework

RESEARCH METHOD

The researcher used the true-experimental one-group pre-test-posttest design. Before treatment (independent variable), the sample was pre-tested, and how well students performed was evaluated; post-testing was conducted after treatment. To draw a conclusion, the pretest and post-test were compared.

- Pretest Observation = O1
- Treatment = X
- Post-test Observation = O2

The study focused on 70 Grade 4 students (ages 9 to 10) in Cantt Board Peshawar Cantt, identifying an experimental group of 30 students with dysgraphia through systematic sampling and a standardized checklist. This approach ensured consistent identification and an acceptable level of dependability in participant selection, as the 30 students represented 42.9% of the total population. A single-group pre-test/post-test design was employed, with participants being compared within the group instead of against a control group. Demographic information was collected on participants' names, ages, classes, and genders. A pre-test before intervention and a post-test after treatment were conducted. A checklist measuring learning problems created by the National Centre of Learning Disability (2007) and verified by Ashraf and Najam (2014) has been used to evaluate writing impairment issues in research participants. The checklist's ten (10) components revealed signs of pupils' difficulties with writing. A specific impairment for language difficulties is indicated with a 1 (yes) or a 0 (no) on the checklist, which assesses the participant's response regarding whether they have LDs. There are more indications of writing issues and puzzles when the participant score is high. According to Ashraf & Najam's (2014) previously confirmed research, the checklist's alpha reliability was 0.90 ($\alpha = .94$).

After the intervention for 7 weeks, a post-test was conducted. Standardised tests were administered to the study group before and after the treatment to assess changes in word recognition, reading, and spelling skills. The difference in scores was used to measure the treatment's effect. By controlling for factors that remain constant over time, this method effectively addresses the study's goal of evaluating the treatment's impact.

Before the Pre-test consent forms were given to the head of the school of the study. The data collected was purely utilized for research purposes and was kept confidential.

Strategies Used during Study

Students with dysgraphia were provided a supportive atmosphere for the modification of their social-emotional well-being and overall school experience. The cursive writing developed by establishing a regular writing routine that includes warm-ups, stretching exercises, and breaks to help children stay focused and avoids fatigue. Training on how to use a computer to type a sentence: Students were given training and time to learn through the computer to develop their writing skills. These strategies promoted confidence, creativity, and self-expression in students with dysgraphia.

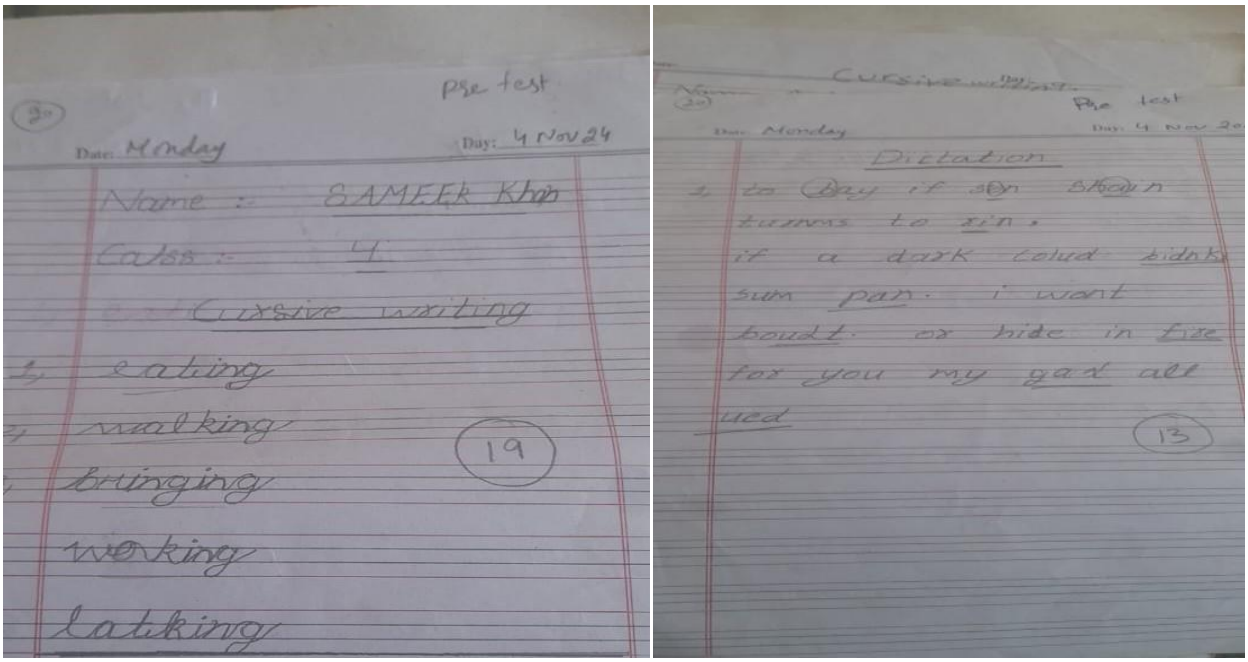

Figure 2: Pre-tests Cursive Writing **Pre-test Dictation**

The threats were that the members of groups have an impact on one another. In order to overcome these threats, distinct groups were made to encourage participants to refrain from disclosing specifics of the intervention**.**

Post-testing measures were selected based on their reliability and validity as demonstrated in prior research (Jones & Williams, 2018; Clark et al., 2021). Implementing the strategies for students to develop their writing skills, a supportive environment was provided. However, after the intervention, a post-test was conducted.

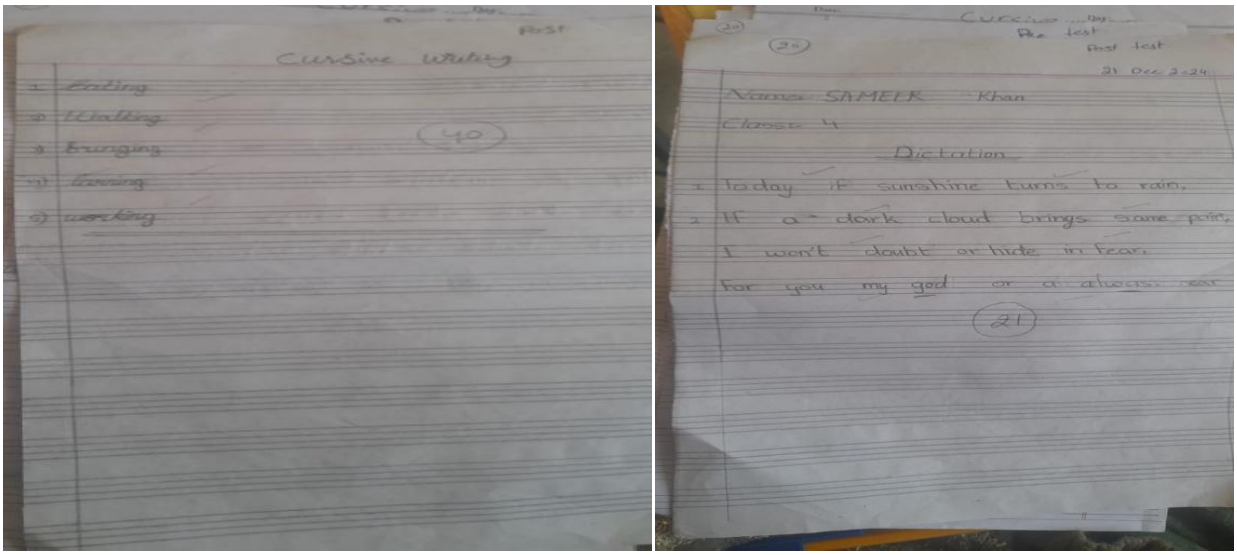

Figure 3: Post-test- Cursive Writing **Post-test Dictation**

DATA ANALYSIS

This study's statistical analysis method is the paired t-test, a potent instrument for comparing the means of two similar groups or situations (Aberson, 2015; Howell, 2012). The paired t-test's null hypothesis (Ho) states that there is no significant difference between instructors' experiences before and after the intervention. According to the alternative hypothesis (Ha), these two time points differ significantly. With the traditional teaching method, the dysgraphia student's pre-test was taken, and after creating a friendly classroom environment, different strategies were applied, and the post-test was taken and compared to find out the difference between both tests.

Table 1: The Percentage Improvement after Creating Friendly Classroom Environment

S. No.	Pre-test Dictation (%)	Post-test Dictation (%)	% Improvement (Dictation)	Pre-test Typing (%)	Post-test Typing (%)	% Improvement (Typing)	Pre-test Cursive Writing (%)	Post-test Cursive Writing (%)	% Improvement (Cursive)
1	28	84	≈200.00≈200.00	32	78	≈143.75≈143.75	38	82	≈115.79≈115.79
2	32	80	≈150.00≈150.00	36	78	≈116.67≈116.67	34	80	≈135.29≈135.29
3	36	72	≈100.00≈100.00	24	68	≈183.33≈183.33	36	76	≈111.11≈111.11
4	36	80	≈122.22≈122.22	32	84	≈162.50≈162.50	30	78	≈160.00≈160.00
5	48	84	≈75.00≈75.00	48	88	≈83.33≈83.33	20	70	≈250.00≈250.00
6	20	92	≈360.00≈360.00	40	92	≈130.00≈130.00	24	76	≈216.67≈216.67
7	24	64	≈166.67≈166.67	36	72	≈100.00≈100.00	30	64	≈113.33≈113.33
8	20	68	≈240.00≈240.00	44	96	≈118.18≈118.18	32	80	≈150.00≈150.00
9	20	72	≈260.00≈260.00	32	72	≈125.00≈125.00	30	74	≈146.67≈146.67
10	32	78	≈143.75≈143.75	24	78	≈225.00≈225.00	28	78	≈178.57≈178.57
11	32	80	≈150.00≈150.00	20	80	≈300.00≈300.00	26	78	≈200.00≈200.00
12	44	84	≈90.91≈90.91	36	84	≈133.33≈133.33	26	76	≈192.31≈192.31
13	48	92	≈91.67≈91.67	40	92	≈130.00≈130.00	22	70	≈218.18≈218.18
14	32	96	≈200.00≈200.00	44	96	≈118.18≈118.18	24	58	≈141.67≈141.67
15	40	8	≈−80.00≈−80.00	36	78	≈116.67≈116.67	34	80	≈135.29≈135.29

16	24	92	≈283.33≈283.33	36	92	≈155.56≈155.56	20	74	≈270.00≈270.00
17	32	78	≈143.75≈143.75	52	92	≈76.92≈76.92	32	82	≈156.25≈156.25
18	48	80	≈66.67≈66.67	40	80	≈100.00≈100.00	38	86	≈126.32≈126.32
19	52	96	≈84.62≈84.62	48	96	≈100.00≈100.00	20	78	≈290.00≈290.00
20	32	84	≈162.50≈162.50	52	84	≈61.54≈61.54	26	76	≈192.31≈192.31
21	28	78	≈178.57≈178.57	36	78	≈116.67≈116.67	42	86	≈104.76≈104.76
22	20	72	≈260.00≈260.00	28	72	≈157.14≈157.14	36	72	≈100.00≈100.00
23	32	72	≈125.00≈125.00	28	72	≈157.14≈157.14	30	72	≈140.00≈140.00
24	32	84	≈162.50≈162.50	32	84	≈162.50≈162.50	36	82	≈127.78≈127.78
25	44	84	≈90.91≈90.91	40	88	≈120.00≈120.00	38	86	≈126.32≈126.32
26	32	92	≈187.50≈187.50	44	92	≈109.09≈109.09	22	76	≈245.45≈245.45
27	32	84	≈162.50≈162.50	60	88	≈46.67≈46.67	36	72	≈100.00≈100.00
28	44	88	≈100.00≈100.00	28	80	≈185.71≈185.71	38	80	≈110.53≈110.53
29	24	88	≈266.67≈266.67	40	88	≈120.00≈120.00	22	70	≈218.18≈218.18
30	76	78	≈2.63≈2.63	32	78	≈143.75≈143.75	32	78	≈143.75≈143.75

To analyze the improvement in test scores for students with dysgraphia and calculate the percentage difference between pre-test and post-test scores, the researcher followed these steps:

1. Calculated the improvement for each test type.
2. Calculated the percentage improvement using the formula:

Percentage Improvement = (Post-test Score−Pre-test Score/Pre-test Score) ×100

Table no. 1 examination of percentage improvements in test scores for students with dysgraphia revealed significant advances in all tested areas following the establishment of a supportive classroom environment and innovative teaching practices, specifically:

Overall, these findings indicate that the intervention resulted in significant improvement in students' writing abilities, like 80% in dictation, 30% in typing and 29% in cursive writing, demonstrating the favorable influence of a supportive learning environment and tailored teaching approaches.

Table 2: Paired Sample t-test Result

Paired Samples Test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference Lower	Upper			
Pair 1	Dictation Pre Test Marks - Dictation Post Test Marks	-11.50000	3.24569	.59258	-12.71196	-10.28804	-19.407	29	.000
Pair 2	Typing Pre Test Marks - Typing Post Test Marks	-11.40000	1.79271	.32730	-12.06941	-10.73059	-34.830	29	.000
Pair 3	Cursive Writing Pre Test Marks - Cursive Writing Post Test Marks	-23.10000	2.98675	.54530	-24.21527	-21.98473	-42.362	29	.000

The results of a paired samples t-test conducted on three types of assessments for students with dysgraphia: dictation, typing, and cursive writing. A paired samples t-test is used to determine whether there is a statistically significant difference between the means of two related groups.

Table no. 2 shows the t statistic and degrees of freedom (df). The t-value indicates the size of the difference relative to the variation in the sample data. Larger t values suggest a more significant difference. The degrees of freedom (df = 29) correspond to the number of paired samples minus one (n-1). The significance level (*p*-value) indicates whether the results are statistically significant. A *p*-value less than 0.05 typically indicates a significant result. In the data, all pairs show a *p*-value of .000, meaning there is a highly significant difference between pre-test and post-test marks for each type of assessment. The t-test results clearly indicate significant differences (*p*-value = .000) between pre-test and post-test scores across all three writing modalities, suggesting that treatment had a significant impact on students' writing skills. Based on the results, however, reject the null hypothesis and accept the alternate hypotheses.

DISCUSSIONS

The statistics reveal that the classroom setting and innovative teaching tactics dramatically enhanced students' dictation, typing, and cursive writing skills. A paired-sample correlation demonstrated a moderate to strong positive link (r = 0.668) between pre- and post-test typing scores, with a highly significant p-value (0.000), indicating major improvement. T-test analysis revealed significant differences between pre- and post-test scores for all tasks, indicating the intervention's effectiveness. Overall, the findings indicate that the programme had a significant favourable effect on students' writing skills. To measure learning difficulties, including dysgraphia, among elementary school students using a computer as an instrument, a study titled "Development of Learning Difficulty Test: A Case Study in Elementary Schools" established protocols and assessed the quality of test instruments (Aziz et al., 2021). According to the results, 90% of pupils struggled with learning, and the exam was deemed dependable with excellent interpretation in every category. Another helpful accommodation for pupils with dysgraphia is the availability of speech-to-text software. For kids of all grades, free and easy-to-use dictation technologies such as Apple's Speak Screen feature, Dragon Dictation, and Google's voice typing can help with their writing assignments (Puranik & Li, 2022). The author states that cursive writing has fewer beginning points than detached print letters; therefore, writing may be done more quickly, with more regular letter sizes, and with a cleaner overall look. Once students are comfortable with keyboards, typing may be simpler than writing.

CONCLUSIONS

Pre-test and post-test results for evaluations of typing, cursive writing, and dictation show significant and statistically significant improvements after the intervention. According to the mean differences, pupils generally made significant growth in all three categories, with cursive writing showing the biggest improvement. The statistical metrics, such as t-values, *p*-values, and confidence intervals, verify that these improvements are extremely significant and unlikely to be the result of chance. The value of using a diversified instructional strategy that addresses a range of learning requirements is shown by the variation in individual student responses. The classroom environment was supportive; it has influenced the improvement seen in the experimental group. It is concluded that there are significant improvements in dictation, typing and cursive writing scores, indicating that the students benefited from the innovative teaching strategies and the environment was supportive, especially in tasks that require writing skills.

Implications and Recommendations

Dysgraphia affects writing due to issues with spatial vision, motor skills, and slow writing speed, with some aspects related to linguistic dysgraphia impacting executive functioning and spatial planning. On the basis of the finding, the following suggestions are recommended.

- Individual help must be given to students who have made less progress.
- Regular monitoring ought to be done for students after intervention.
- Students must benefit from a variety of learning strategies while using multiple teaching methods, such as kinaesthetic, visual, and technical aids, in order to adapt and maximize outcomes.
- Collaboration is required among the teachers who can help promote best practices and enhance writing abilities.
- In order to improve intervention strategies, additional research is recommended to observe the variables affecting student performance variability, especially those with negligible or negative benefits.

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REFERENCES

Aberson, C. L. (2015). Statistical Power Analysis. Emerging Trends in the Behavioral and Social Sciences. Hoboken, NJ: Wiley, 1-14.

Ashraf, F., & Najam, N. (2017). Identification of Learning Disabilities in Students: A Gender Perspective. Pakistan Journal of Social and Clinical Psychology, 15(1), 36-41.

Attitude Magazine. (2022). What is Dysgraphia? Understanding Common Symptoms. https://www.additudemag.com/what-is-dysgraphia-understanding-common-symptoms/?srsltid=afmboopjqjorlzl3zggqyz9edhzqfd7iqehgo-fql0zrwjxfey8ijf7

Ayar, G., Yalçın, S. S., Tanıdır Artan, Ö., Güneş, H. T., & Çöp, E. (2022). Strengths and Difficulties in Children with Specific Learning Disabilities. Child: Care, Health and Development, 48(1), 55-67.

Aziz, A., Jamaris, M., & Sumadi, T. (2021). Development of a Learning Disabilities Test: A Case Study at Elementary School. COUNS-EDU: The International Journal of Counseling and Education, 6(3), 129 134

Berninger, V. W. (2008). Defining and Differentiating Dysgraphia, Dyslexia, and Language Learning Disability within a Working Memory Model.

Berninger, V. W., & Richards, T. (2008). Brain Literacy for the 21st Century: The Learning Brain and Literacy Instruction. Paul H. Brookes Publishing.

Berninger, V. W., & Swanson, H. L. (1994). Research on Writing: Implications for Practice. The Elementary School Journal, 94(5), 511–536. https://doi.org/10.1086/461674

Bukowski, C. (1993). The Laughing Heart. Retrieved December 19, 2021, from Prairie Schooner:https://prairieschooner.unl.edu/laughing-heart-charles-bukowski (PDF) The Reducing Effect of Using Poetry in ELT Classrooms on Writing Anxiety of High School Students. Available from: https://www.researchgate.net/publication/359064728_the_reducing effect_of_using_poetry_in_elt_classrooms_on_writing_anxiety_of_high_school students [accessed jul 24 2025].

Cataudella, S., Carta, S., Mascia, M. L., Petretto, D. R., & Penna, M. P. (2021). Psychological Aspects of Students with Learning Disabilities in E-Environments: A Mini-Review and Future Research Directions. Frontiers in Psychology, 11, 611818.

Chung, P. J., Patel, D. R., & Nizami, I. (2020). Disorder of Written Expression and Dysgraphia: Definition, Diagnosis, and Management. Translational Pediatrics, 9 (Suppl 1), S46.

D'Entremont. (2017). Bird of a Colour. Candlewick Studio Publisher; Brdbk Edition France

Ediger, M. (2002). Assessing Handwriting Achievement. Reading Improvement, 39, 103-110

Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2018). Learning Disabilities: From Identification to Intervention (2nd ed.). Guilford Publications.

Gary, A., Moore, A., Hilliard, W., Day, M., Boswell, B., & Barnhill, M. (2023). Understanding Dysgraphia. Nursing Made Incredibly Easy, 21(2), 15–22.

Gubbay, S. & De Klerk, N. (1995). A Study and Review of Developmental Dysgraphia in Relation to Acquired Dysgraphia. Brain and Development, 17, 1

Guffey, M. E., & Loewy, D. (2012). Business Communication: Process and Product (7th ed.). South-Western Cengage Learning.

Gvion, A., & Friedmann, N. (2012). Phonological Short-Term Memory in Conduction Aphasia. Aphasiology, 26(3-4), 579-614.

Harris, K. R., & Graham, S. (2016). Self-Regulated Strategy Development in Writing. Insights from the Behavioral and Brain Sciences, 3(1), 77–84. https://doi.org/10.1177/2372732215624216

Hayati, S., Armansah, Y., & Ismail, S. F. A. B. (2021). Teachers Experiences on Blended Learning: A Case Study of a Group of Secondary School Teachers in Malaysia and Indonesia. Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 7(4), 767-777.

Hcsuper. (2022, November 9). Differentiated Instruction: Examples & Classroom Strategies Resilient Educator. Resilient Educator. https://resilienteducator.com/classroom-resources/examples-of-differentiated-instruction/

Hebert, M., Kearns, D. M., Hayes, J. B., Bazis, P., & Cooper, S. (2018). Why Children with Dyslexia Struggle with Writing and How to Help Them. Language Speech and Hearing Services in Schools, 49(4), 843–863.

Howell, D. C. (2012). Statistical Methods for Psychology. Wadsworth Publishing Company. https://www.additudemag.com/what-is-dysgraphia-understanding-common-symptoms/?srsltid=afmboopjqjorlzl3zggqyz9edhzqfd7iqehgo-fql0zrwjxfey8ijf7_

Jones, B. (2018). An Experiential Look at Learner Engagement in University EFL Courses in Japan. EdD Thesis, University of Reading.

Keller, W. (2004). International Technology Diffusion. Journal of Economic Literature, 42(3), 752-782.

McCloskey & Rapp, (2017). Developmental Dysgraphia: An Overview and Framework for Research.

Pelatti, C. Y., & Piasta, S. B. (2017). Improving Literacy Outcomes for At-Risk Kindergartners through an Afterschool Tutoring Program: Results from a Feasibility Study. Frontiers in Education, 2. https://doi.org/10.3389/feduc.2017.00027

Puranik, C., & Li, H. (2022). Self-Regulation and Early Writing: A Longitudinal Examination from Preschool through First Grade. Journal of Experimental Child Psychology, 220, 105420. https://doi.org/10.1016/j.jecp.2022.105420

Reddy, L. A., Glover, T. A., Dudek, C. M., Alperin, A., Wiggs, N. B., & Bronstein, B. (2022). A Randomized Trial Examining the Effects of Paraprofessional Behavior Support Coaching for Elementary Students with Disruptive Behavior Disorders: Paraprofessional and Student Outcomes. Journal of School Psychology, 92, 227–245. https://doi.org/10.1016/j.jsp.2022.04.002

Richards, R. (1999). The Source for Dyslexia and Dysgraphia. East Moline, IL: Lingui Systems.

Seyyedrezaei, S. H., Khajeaflaton, S., Ghorbani, S., & Dana, A. (2023). Relative Age Effects on Children's Handwriting: Role of Visual Motor Integration. Zenodo (CERN European Organizationfor Nuclear Research). https://doi.org/10.22038/ijp.2020.52763.4179

Shaywitz, S. (2003). Overcoming Dyslexia: A New and Complete Science-Based Program for Reading Problems at Any Level. Knopf.

Suwartono, T., Karini, Z., & Pungki, O. D. (2019). Teacher Approaches to Teaching a Large EFL Class. KhazanahPendidikan, 13(1).

Ye, Y., Inoue, T., Maurer, U., & McBride, C. (2023). Routledge International Handbook of Visual-Motor Skills, Handwriting, and Spelling. In Routledgee Books. https://doi. org/10.4324/9781003284048

Yekeler, D., Yıldız, M., Aktaş, N., & Ataş, M. (2022). Handwriting Speeds of 4^{th}–8^{th} Grade Students. International Electronic Journal of Elementary Education. https://doi.org/10.2 6822/iejee.2023.284

Zain, F. N. & Mumpuniarti (2018). Early Writing Skill Intervention for Elementary Students with Learning Disability: A Systematic Review Advances in Social Science, Education and Humanities Research, 296, p.194-200