ACCESS ARRANGEMENT PRACTICES, ITS EFFECTIVENESS AND INFLUENCE ON THE PERFORMANCE OF LEARNERS WITH DYSGRAPHIA IN PUBLIC LOWER-PRIMARY SCHOOLS IN VIHIGA COUNTY, KENYA

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Abstract:

The study explored the access arrangement practices, their effectiveness, and their influence on the performance of learners with dysgraphia in public lower-primary schools in Emuhaya Sub-County, Vihiga County. This study was anchored on Robert Gagne's Conditions of Learning theory, proposed in 1965. A descriptive research design was adopted. The study aimed to include all 163 learners diagnosed with dysgraphia enrolled in lower public primary schools within the Emuhaya sub-county. Additionally, the study targeted 16 headteachers from public primary schools, 153 teachers, and 10 sub-county Education officers in the same sub-county. The researcher utilized stratified sampling to select 5 public primary schools. Purposive sampling was used to select 5 headteachers from the sampled schools. Similarly, purposive sampling was employed to select 6education officers from the Emuhaya sub-county. The researcher sampled 50 lower primary school teachers and 50 learners identified with dysgraphia from grade 1 to grade 3 in the sampled schools using simple random sampling. The researcher employed a combination of open and closed questionnaires, as well as interview guides, to gather data from different categories of participants. A pilot study was conducted in two public primary schools, which were not included in the main data collection. Qualitative data underwent content analysis, while quantitative data was analyzed using frequencies and percentages with SPSS. Results indicated that schools in Emuhaya

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utilized various access arrangements for students with dysgraphia. Dysgraphia was found to impact academic performance negatively, but with intervention, student performance improved by 5%–10% in successive exams. Students reported a positive change in attitude towards education due to the intervention, feeling supported by the school. The study concluded that access arrangements have an impact on the academic performance of students with dysgraphia. Before the intervention, dysgraphia hurt students' academic performance, as evidenced by poor performance in previous exams. The study recommended that the government need to implement a systematic identification method for documenting students with learning disabilities early in their academic journey. Early identification and intervention can significantly improve outcomes for dysgraphia students and facilitate timely support and resources. Schools should prioritize the implementation of recommended interventions to support dysgraphia students, promote inclusivity, and foster a positive attitude towards education among all students, regardless of their learning needs.

Keywords: access arrangement practice; access arrangements; earners with dysgraphia performance; public lower-primary schools; specialized learning disability (SPLD)

1. Introduction

Access arrangements are widely used to facilitate learning assessments among learners with learning disabilities. According to Tyrell and Woods (2019), access arrangements (AAs) are pre-implemented interventions to support learners with learning disabilities in exams. Dysgraphia has been identified as one of the primary learning disabilities witnessed among a learner that manifests itself in an inability to write or form letter shapes due to brain damage coherently (Razali, 2017). Dysgraphia, or disorder of written expression, manifests as challenges in composing written text. Its features encompass illegible handwriting, distorted letter shapes, disjointed writing, spelling mistakes, and difficulty expressing ideas in writing (Feizefu, 2021). As per the DSM-5, dysgraphia is characterized as a "*specific learning disorder with impairment in written expression*" (APA, 2013). Poorly developed handwriting has multifaceted effects on learners. Firstly, it detrimentally influences their self-esteem and sense of worth (Bamidele, 2017). Secondly, it affects physical behaviors such as attendance, seating position, assignment completion, and planning strategies (Limpo *et al.*, 2018), potentially leading to learner stigma. Individuals, including those with dysgraphia, may encounter stigma in various settings (Izuchi & Agamugoro, 2021). Finally, it adversely impacts overall academic performance by diminishing the quality and quantity of both persuasive and cognitive writing (Santangelo & Graham, 2016, as cited in Mulanya, 2020).

Writing is a fundamental aspect of language and literacy, with broad applications both in and out of the classroom (Finlayson & McCrudden, 2020; Graham, 2019). It serves various purposes, such as learning, information recording, persuasion, entertainment, and emotional expression (Graham, 2019). Writing skills typically develop during early

childhood, so when a child begins to exhibit writing problems, it may indicate dysgraphia. While dysgraphia diagnosis and management often occur within educational settings, teachers play a crucial role in guidance and assessment. Research suggests that the prevalence of writing disorders tends to decrease with age. For instance, Feizefu (2021) noted a decrease in dysgraphia from 37% to 17% among second-grade learners throughout a school year, with further reductions in subsequent grades. Reynold (as cited in Feizefu, 2021) estimated the prevalence of dysgraphia to be between 5% and 20% among students with various writing deficits.

In the United States, different learning disabilities, including dysgraphia, necessitate the implementation of varying access arrangements provisions (McMurray, Callaghan, & McVeigh 2018). Similarly, Teachers in Australia are increasingly tasked with supporting learners with diverse needs and abilities, driven by education policies and teaching standards that prioritize inclusivity (Australian Curriculum, Assessment and Reporting Authority, 2022, 2023; Education Council, 2019; Nationally Consistent Collection of Data on School Students with Disability, 2021b). Inclusive education advocates for the rights of all children to participate and receive support in their learning journey (Australian Institute for Teaching and School Leadership, 2020). In South Africa, dysgraphia holds significance within the spectrum of learning disabilities. The government actively promotes equitable education for learners with special needs to ensure comprehensive education for all (Moodley, 2017). The Department of Education advocates for access arrangements to accommodate students with learning difficulties. Despite these efforts, there remains a gap in the implementation of standardized access arrangement approaches (Moodley, 2017). Specialized education centers in South Africa provide assistive access arrangements for learners with special needs (Mutanga, 2017). While these measures demonstrate progress in supporting special needs education in South Africa, it is crucial to assess whether similar provisions are in place in Kenyan schools.

In Nigeria, Nkomo (2020) employed a descriptive survey design to investigate the prevalence of learning disorders among undergraduate students in the Faculty of Education at Cross River University of Technology, Calabar, Nigeria. The findings highlighted that male undergraduate students in this faculty faced more challenges with writing skills compared to their female peers. Additionally, the study indicated that students experiencing difficulties with their writing abilities tended to perform poorly overall. These findings underscore the impact of dysgraphia on learners' performance, emphasizing the importance of ensuring that teachers implement appropriate accommodations to support students with learning disabilities during assessments.

The concept of inclusive education in Kenya is rooted in the belief that education is a fundamental human right and a cornerstone for a just society. It encompasses providing education to all individuals, including those with disabilities, for their overall development. This philosophy aligns with international agendas like the World Declaration on Education for All. The Kenyan government has ratified various national and international frameworks to ensure education for all, including individuals with

disabilities, as evident in policies such as the Education for All (EFA), Millennium Goals, and conventions on the rights of children and persons with disabilities. Since Kenya's independence, the government has established numerous education commissions and committees to promote inclusive education. In Vihiga County, similar challenges exist, with a significant dropout rate among students, particularly those with learning disabilities. Lack of support in regular classrooms contributes to these difficulties. Despite this, there is a notable absence of research in the county specifically addressing teachers' awareness and support for learners with learning disabilities, which is essential for effective inclusive education in public primary schools. Research by Kinyua (2008) highlights learning disabilities, including dysgraphia, as significant challenges in Kenya.

The struggle with handwriting among students poses significant challenges for both teachers and learners, impacting academic performance and hindering the teaching and learning process. Research in developed countries has highlighted the use of access arrangements to aid learners with special needs, including learners with dysgraphia. Despite efforts to implement inclusive education supported by legislative measures in Kenya, challenges persist, including policy ambiguity and inadequate support for learners with special needs like dysgraphia. In Vihiga County, similar challenges exist, with a notable lack of research addressing teachers' awareness and support for learners with dysgraphia. Despite the prevalence of dysgraphia among lower primary learners in Vihiga County, little is known about its extent and impact in the county. Challenges faced by these learners include limited access to learning opportunities, inadequate learning materials, and difficulties in expressing themselves.

1.1 Purpose of the Study

The purpose of this study was to establish how access arrangement practices, influence the performance of learners with dysgraphia in public lower-primary schools in Emuhaya Sub-County.
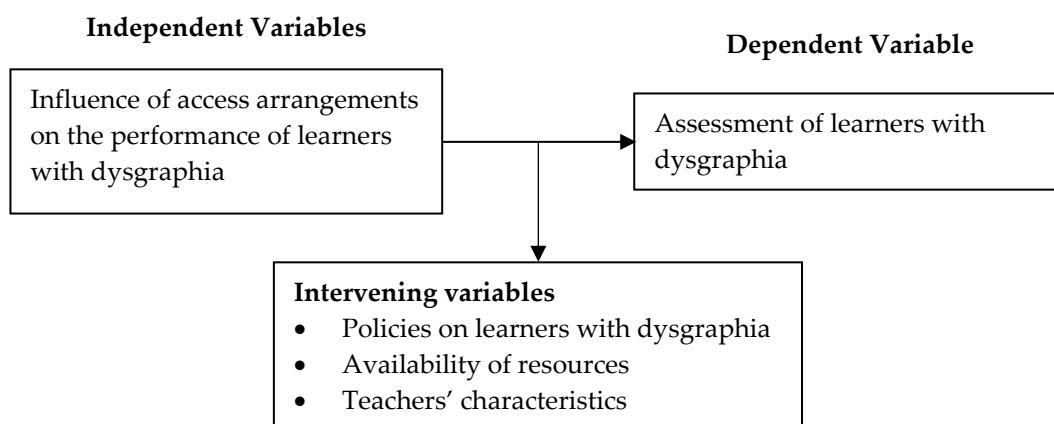
1.2 Conceptual Framework

Independent Variables

Dependent Variable

Influence of access arrangements on the performance of learners with dysgraphia

Assessment of learners with dysgraphia

Intervening variables
- Policies on learners with dysgraphia
- Availability of resources
- Teachers' characteristics

Figure 1: Conceptual Framework

2. Literature Review

This section discusses the theoretical framework and the literature related to the study topic.

2.1 Theoretical Framework

This study draws aspirations from Robert Gagne's Conditions of Learning theory, proposed in 1965. This theory posits that there are different types and levels of learning and that other conditions are required for different types and levels of education (Gagné & Gagné, 1985). The theory thus emphasizes the provision of specific requirements to achieve effective learning. According to Leow and Neo (2014), providing necessary conditions facilitates learning, as evidenced by incorporating interactive technological innovations in modern-day classrooms. Gagné proposed that learning occurs hierarchically, progressing through different types of learning outcomes. These outcomes range from simple to complex cognitive processes. He identified five categories:

- **Verbal Information:** Acquiring facts and concepts.
- **Intellectual Skills:** Developing problem-solving abilities and critical thinking.
- **Cognitive Strategies:** Learning strategies to facilitate learning and problem-solving.
- **Motor Skills:** Acquiring physical skills and coordination.
- **Attitudes:** Forming and changing attitudes and beliefs.

Gagné identified nine instructional events or conditions that should be present for effective learning to take place. These conditions serve as guidelines for educators in designing instruction: Gaining attention: Attracting the learner's attention to the instructional material. Informing learners of the objective: Clearly stating the learning goals and objectives. Stimulating recall of prerequisite learning: Activating the learner's prior knowledge relevant to the new material. Gagné's theory has practical implications for instructional design. Educators can use his nine events of instruction to create effective learning experiences that cater to different types of learning outcomes. By carefully considering each condition, instructional designers can optimize the learning process and enhance learner outcomes.

While Gagné's Conditions of Learning theory has been influential in instructional design, it has also faced criticism. Some critiques highlight its rigid, linear approach to learning and argue that it may oversimplify the complexity of the learning process. Additionally, advancements in cognitive psychology and neuroscience have led to the development of alternative theories that offer different perspectives on learning. Despite these criticisms, Gagné's theory remains relevant in educational practice, providing a systematic framework for instructional design and contributing to our understanding of how people learn. Educators continue to draw upon his ideas to create engaging and effective learning experiences for students.

2.2 The Influence of Access Arrangements on Students with Dysgraphia

The growing presence of learners with disabilities in inclusive educational settings underscores the increasing importance of collaboration between general education and special education teachers. School personnel, including teachers, play a pivotal role in helping students overcome both primary effects (challenges within the classroom) and secondary effects (impacts outside the classroom, such as communication difficulties and bullying) of learning disabilities, thereby enabling them to lead fulfilling lives (Halder & Sacks, 2017). Kaur (2017) highlights the Special Education Policy of Ontario, Canada, which emphasizes the importance of identifying students and their learning needs through Individualized Education Programs (IEPs). This policy advocates for the implementation of appropriate accommodations, program modifications, alternative programs, and specific instructional and assessment strategies to address the difficulties students may encounter. Furthermore, Kaur (2017) provides insight into the success achieved by individuals who participated in a Bridging Program for Internationally Educated Professionals at the Faculty of Liberal Arts and Professional Studies in Ottawa, Canada.

Different access arrangements have had other influences on the performances of students with dysgraphia. For instance, Scheef, Hollingshead, and Voss (2019) argued that the provision of access arrangements to students with special needs helps them improve their performance in exams. Scheef *et al.* (2019) explained that by providing access arrangements to these students with special needs, the examiners help them bridge the gap created by the disability, thus allowing them to take the exams as their counterparts without any form of disability. Their performances tend to improve this way since the barrier is removed. Contrary to Scheef *et al.*'s (2019) argument, McGhee (2020) doubts the effectiveness of access arrangements. Even though McGhee (2020) highlights that access arrangements are used in schools in the UK and goes ahead to explain that these access arrangements are regulated by Ofqual (a respected examination body in the UK), the study argues that Ofqual lacks the system to evaluate the effects of access arrangements.

The research done by Duncan and Purcell (2017) poses the question of the question of whether access arrangements bring equity or unfair advantage to students with special needs compared to their counterparts who do not qualify for the access arrangements. According to this study, providing one or more access arrangements, like 25% extra time and word processors, results in an advantage over other learners. Going by the arguments brought forward by these three studies, more questions are posed around the effects of access arrangements in terms of the academic performances of learners who receive them. Therefore, this study sought to clear this confusion by evaluating the influence of access arrangements on the versions of learners with dysgraphia in the Emuhaya sub-county, Vihiga County.

3. Methodology

3.1 Research Design and Target Population

In this study, a descriptive research design was adopted. This was informed by the fact that the study was guided by research questions. According to Creswell (2016), descriptive research design systematically describes the facts and characteristics of a specific population or area of interest factually and accurately. Further, it allows the use of multiple instruments to collect data and employ both qualitative and quantitative approaches in collecting and analyzing data. The study aimed to include all 163 learners diagnosed with dysgraphia enrolled in lower public primary schools within the Emuhaya sub-county. Additionally, the study targeted 16 headteachers from public primary schools, 153 teachers, and 10 sub-county education officers in the same sub-county. The total target population for the study comprised 342 individuals.

3.2 Sampling Techniques and Sample Size

The researcher utilized stratified sampling to group the public primary schools in the Emuhaya sub-county according to the three wards in which they were located. Purposive sampling was used to select five headteachers from the sampled schools. Headteachers were chosen intentionally due to their expertise and role in managing school policies, resources, infrastructure, and overall school functioning. Similarly, purposive sampling was employed to select six education officers from the Emuhaya sub-county. The researcher sampled 50 lower primary school teachers, which is 30% of the total population of teachers in the public primary schools within the sub-county. For the selection of pupils, the researcher sampled 50 learners identified with dysgraphia from grade 1 to grade 3 in the sampled schools. Table 3.1 shows that the study had a sample size of 116 respondents, which was a representative portion of the total target population.

Table 1: Sample Size

Category	Target population	Sample size
Schools	16	5
Headteachers	16	5
Teachers	153	50
Education officers	10	6
Learners with dysgraphia	163	50
Total	**342**	**116**

Source: Vihiga County Annual Development Plan (2023).

3.3 Research Instruments

The researcher employed a combination of open and closed questionnaires, as well as interview guides, to gather data from different categories of participants. Headteachers and county education officials, who were proficient in reading and writing, were provided with open questionnaires. Learners who possessed reading and writing skills were administered closed questionnaires. These questionnaires consisted of structured questions with predefined response options, typically requiring a "yes" or "no" response.

Closed questionnaires facilitated efficient data collection and analysis, particularly for participants with literacy skills, by providing standardized response formats. Learners who faced challenges in reading and writing were provided with interview guides.

3.4 Pilot Study

Ensuring the validity and reliability of research instruments is crucial for obtaining accurate and trustworthy findings. In this study, several steps were taken to achieve this. All questions included in the research instruments were directly derived from the study objectives. This ensured that the instruments effectively measured the intended constructs and provided relevant data to address the research questions. The researcher sought guidance from supervisors who are experts in the study area. These supervisors reviewed the research instruments to ensure clarity, relevance, and adequacy of all items. Their input helped refine the instruments and enhance their effectiveness in capturing the required information. Before full-scale data collection, a pilot test was conducted in two public primary schools to assess the reliability of the research instruments. The test-retest method was employed, where the instruments were administered twice to the same group of respondents with a one-week interval between administrations. The consistency of responses between the two administrations was examined, and the results were analyzed using the Cronbach alpha coefficient. A coefficient above 0.7 is generally considered acceptable for reliability. The obtained 0.84, which exceeded 0.7, indicated that the research instruments yielded consistent results across multiple administrations, thereby confirming their reliability.

3.5 Data Collection

The two instruments to collect data were open and closed questionnaires and interview guides. The researcher started by identifying the information to collect from each group. That helped determine the instrument that was used (Kothari, 2004). Most importantly, reading and writing helped determine the instrument to administer. Secondly, the researcher sought the time and place to collect data before highlighting the procedures to follow in interviewing the respondents and informing them how they were expected to fill in the questionnaires and respond to interview questions (Kothari, 2004). That was done after the respondents had been categorized and served with the data collection tools. Lastly, the researcher allowed enough time for the respondents to fill in the questionnaires and conduct the interviews. That was meaningful in ensuring all the respondents had enough time to respond to all questionnaires (Kothari, 2004). This stage was essential in ensuring that all sections of the questionnaires were filled out. At the collection stage, it was necessary to ensure all the respondents responded to the best of their knowledge and satisfaction.

3.6 Data Analysis

Quantitative methods were used to analyze data for this research. Frequencies were utilized to identify and quantify the approaches commonly employed as access

arrangements by educators. This statistical method allowed the researcher to determine the prevalence of various strategies used to support learners with dysgraphia. By counting the frequency of each approach, the study provided insights into the most prevalent and preferred access arrangements among educators. Variances and significance levels were employed to evaluate the extent to which dysgraphia affects students in lower-primary education. Variance analysis enabled the comparison of performance measures across different groups or conditions, such as students with dysgraphia and those without. Significance levels were used to determine whether observed differences in performance were statistically significant, indicating a meaningful impact of dysgraphia on students' academic outcomes. Percentages were utilized to assess the performance levels of learners with dysgraphia.

4. Results and Discussions

4.1 Demographic Information
The demographic characteristics of the respondents, constituting gender, age, current professional qualification, and duration of service, are presented under the following sub-sections:
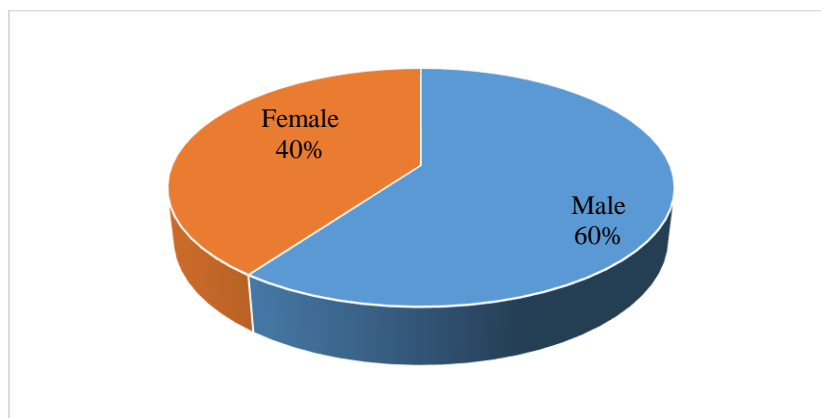
Figure 2: Gender Identity of the Head Teachers
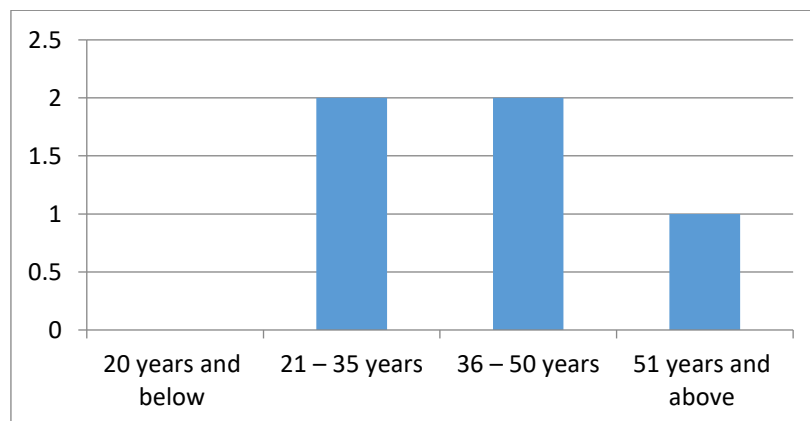
Figure 3: Age of the Head Teacher
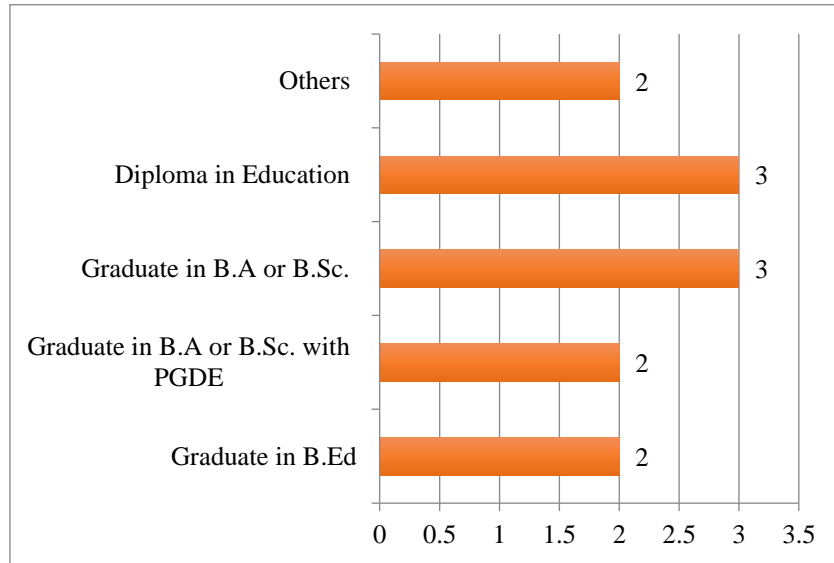
Figure 4: Headteacher's Qualification
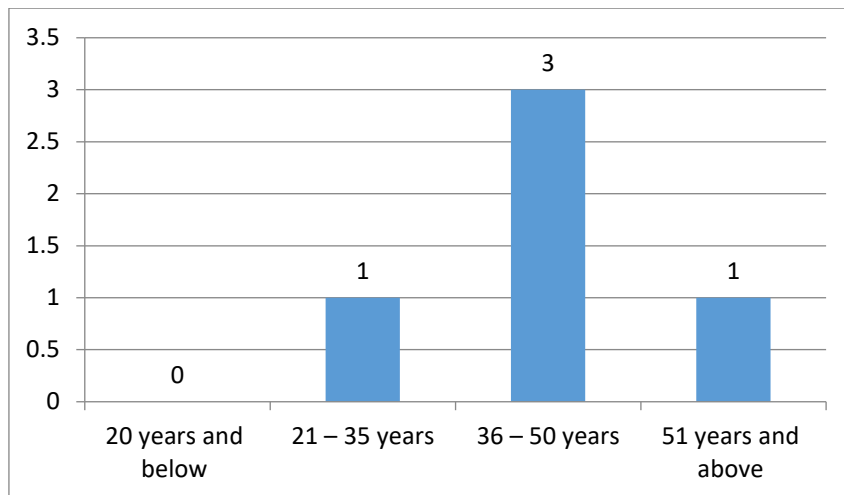
Figure 5: Age of the County Education Officers
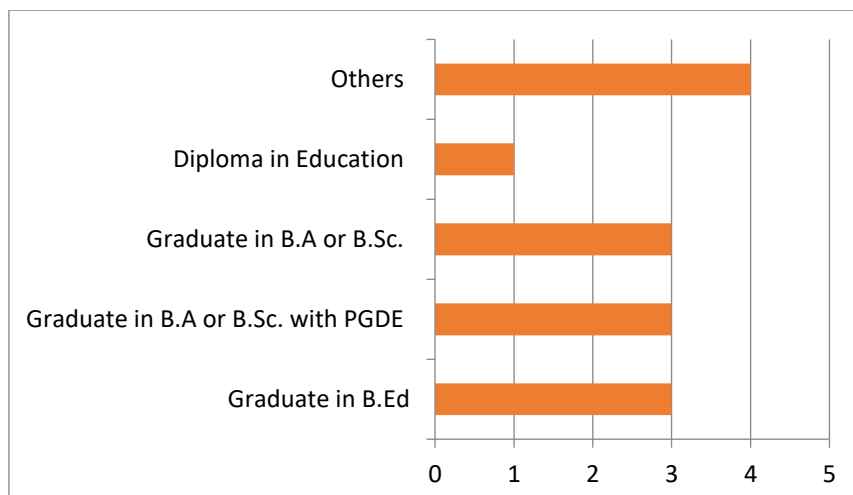
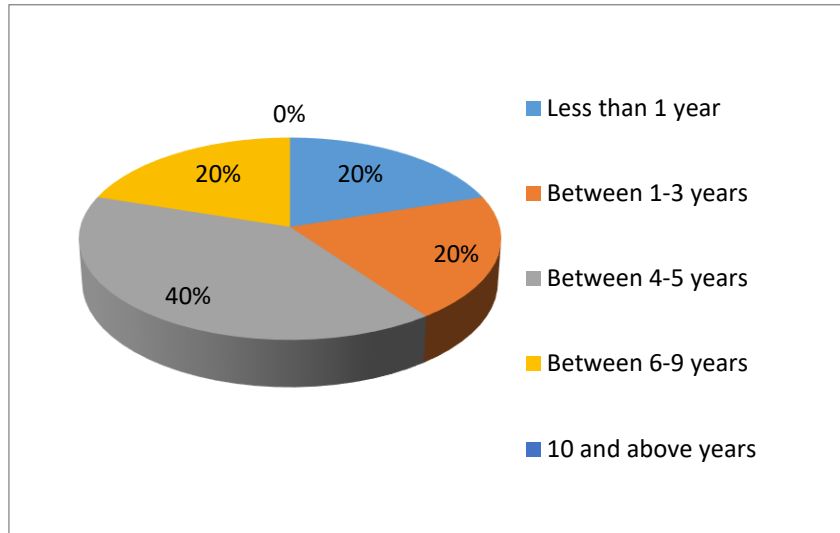**Figure 6:** County Education Officer's Qualification

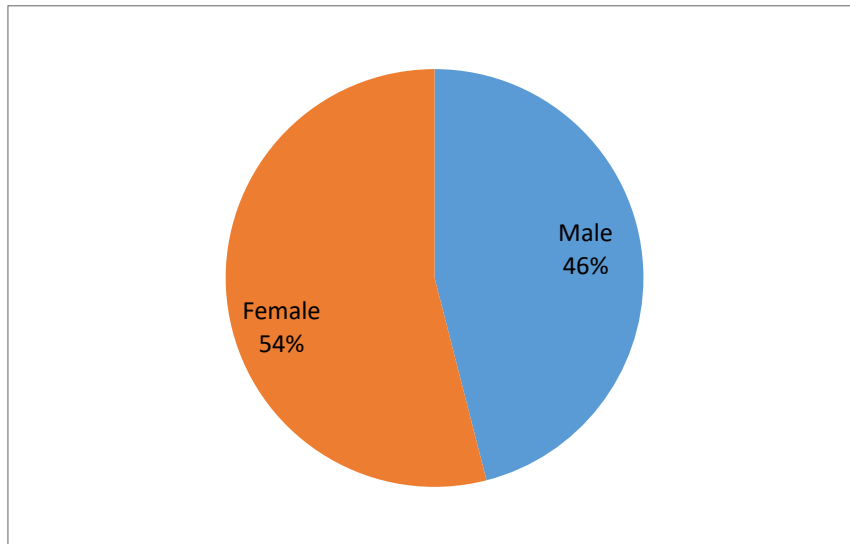**Figure 7:** Period of Service

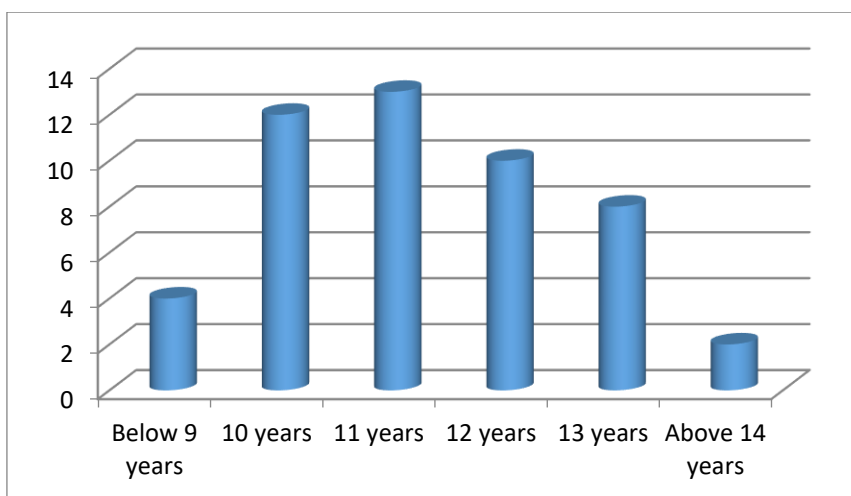**Figure 8:** Gender of the Students

Figure 9: Age of the Students

Based on the figures above (Figures 2-9), the male head teachers comprised 60% of the respondents, while the rest were female. The gender factor was instrumental in identifying which group of teachers had a better interaction with the students, understanding them, and presenting the relevant access arrangements and assessments for students with learning difficulties. Figure 3 indicates that all the respondents (head teachers) were at least 21 years of age. The majority of the teachers were between the ages of 21 and 50 years, while the rest were above 51 years. There was no respondent below 20 years old as they would lack the adequate knowledge and experience to provide the required information about access arrangements for learners with dysgraphia. Figure 4 shows that all the head teachers had multiple qualifications, while the majority had at least two qualifications, testimonials, and training.

Figure 5 indicates that all the county education officers were at least 21 years of age. This is based on the fact that their selection is based on experience and service offered as a teacher. The majority of the officers were between the ages of 36 and 50 years, while the rest were above 51 years or between 21 and 35 years.

Figure 6 shows that all the county education staff had multiple qualifications and training required for their position. The majority had at least 3 qualifications, testimonials, and training. The graph also shows the majority of the teachers had a diploma in education and bachelors of Arts and/or Science. However, more officers were pursuing higher diplomas and PhD, which indicated that they could become better positioned in handling assessments.

Figure 7 shows that 40% of the county education officers have been handling issues of dysgraphia for a period of 4 to 5 years. There was no officer with more than 10 years experience. This can be explained by the fact that county education offices were created not more than 10 years ago upon the creation of counties. Through their previous teaching experiences and interaction with learners with dysgraphia, the county officers must have the necessary information and understanding of the issue to provide valuable insight into the research study. The male students comprised 46% of the respondents while the rest were female. The gender factor was essential in identifying which group of students experienced learning difficulties and the effectiveness of the school intervention approach. The gender difference in dysgraphia students is perceived to involve different intervention approaches for boys and girls based on their strengths, weaknesses interests, and learning behaviors.

Figure 9 indicates that all the respondents (students) were at least 10 years of age and their responses were based on their experiences in lower primary. The majority of the students were between the ages of 11 and 13 years. The purpose of selecting students of this age was to ensure that the respondents had adequate knowledge and experience to provide the required information about access arrangements for learners with dysgraphia. Some of the students had to be assisted to respond to the questions and any respondent below this age was considered too young to understand the requirements.

4.2 Academic Performance of Pupils with Dysgraphia Before and After Intervention

According to the chart, there is an improvement in the average performance of students with dysgraphia after intervention.
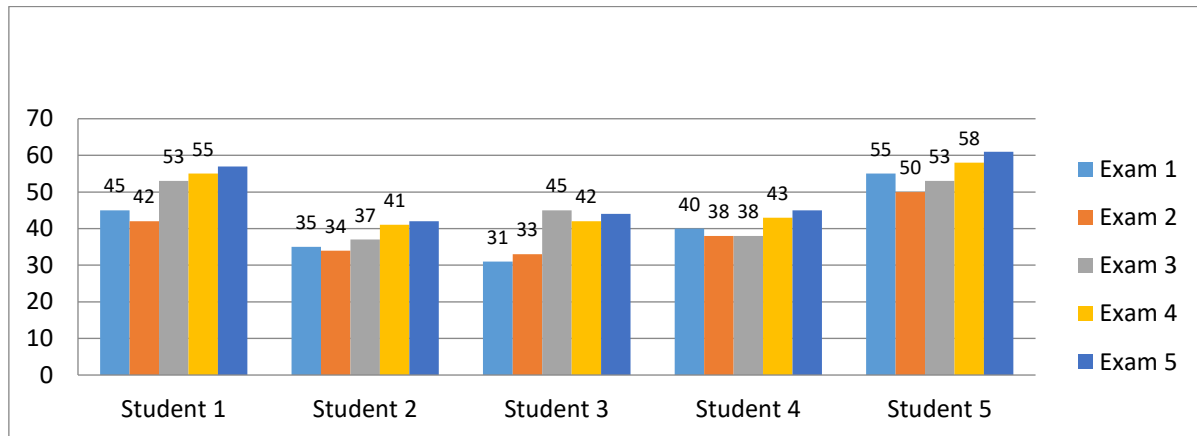

Figure 10: Academic Performances of Pupils with Dysgraphia

Before the access arrangement, the average performance of each of the students was between 5%- 10% less for exam 1 than for exam 5. This implies that the intervention helped the student to perform better than when assessed the same way as other students. The head teachers highlighted 'Extra Time Up To 25%' and 'separate invigilation' as one of the most cost-effective and efficient methods. Additional time intervention can be applied in any school because it allows students with learning difficulties ample time to read and respond to questions. Separate invigilation provides students with dysgraphia a unique environment that is not dictated by the other students, who tend to finish their exams ahead of time and submit their papers while psychologically pressuring the rest to match their time and end up submitting unfinished papers.

Table 2: Headteacher's Perception of Effectiveness of Access Arrangement and Assessment

Level of effectiveness	Frequency	Percent (%)
Very effective	2	40.0
Average	1	20.0
Not effective	2	40.0
I don't know	0	0.0
Total	**5**	**100.0**

Table 2 shows that the school perceived the access arrangement methods used to be very effective in empowering students with any form of learning difficulties to improve academic performance. Students with dysgraphia portrayed some form of improvement after the use of access arrangement and assessment. This observation is based on comparing the five results for exams before and after intervention. Additionally, the head teacher recommended an improved identification, documentation, and intervention approach to children with learning difficulties because most of the schools the head teachers have taught have no verifiable data.

Table 3: County Educational Officials' Perceptions on
the Effectiveness of the Access Arrangement Methods

Level of effectiveness	Frequency	Percent (%)
Very effective	3	40.0
Average	2	40.0
Not effective	1	20.0
I don't know	0	0.0
Total	**5**	**100.0**

Table 3 shows that the county educational officials consider the access arrangement methods in the county very effective in enabling students to improve academic performance. For students with dysgraphia, students showed signs of improvement after the intervention based on the results obtained in the last five exams. Additionally, the county educational officials recommended an amplified identification and intervention for children with learning difficulties because the majority of the cases go unreported.

Table 4: Students' Perceptions on Effectiveness of Access Arrangement Methods

Level of effectiveness	Frequency	Percent (%)
Very effective	21	42.0
Average	20	40.0
Not effective	3	6.0
I don't know	6	12.0
Total	**50**	**100.0**

Table 5 revealed that the students perceived the access arrangement provided by the school to be very effective in enabling them to improve their academic performance. This situation was specifically meant for students with dysgraphia whose average performance in the previous five exams was wanting. In addition, the student recommended that the national government roll out an academic intervention for dysgraphia so that these challenges can be identified at a younger age in students.

5. Conclusions

The study concludes that access arrangements have an impact on the academic performance of students with dysgraphia. Before the intervention, dysgraphia hurt students' academic performance, as evidenced by poor performance in previous exams. However, upon the introduction of access arrangements, there was a notable improvement in academic performance, with students showing an increase of 5%-10% in successive exams. This highlights the effectiveness of tailored interventions in addressing the academic challenges faced by students with dysgraphia. Access arrangements had a positive influence on students' attitudes towards school and their perception of support from educators. Students expressed appreciation for the interventions implemented by the school, indicating that they felt valued and supported in their academic journey.

6. Recommendations

Given the negative impact of dysgraphia on students' academic performance, the government must implement a systematic identification method for documenting students with learning disabilities early in their academic journey. Early identification and intervention can significantly improve outcomes for dysgraphia students and facilitate timely support and resources.

The positive outcomes observed in the study highlight the effectiveness of interventions in improving the academic performance and attitudes of dysgraphia students. It is recommended that schools replicate these interventions and support systems to create inclusive learning environments that cater to the diverse needs of all students, fostering a culture of academic success and empowerment.

Additional inquiry and survey regarding the connection between pupils' academic achievement and each of the access arrangements on assessment recommended. Such a study should involve a bigger student population that can be compared in various schools and counties.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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