

**EFFECTS OF HANDWRITING DIFFICULTIES ON ACADEMIC PERFORMANCE OF LEARNERS WITH LEARNING DISABILITIES IN SELECTED PUBLIC PRIMARY SCHOOLS IN NAIROBI COUNTY, KENYA**

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## **Abstract**

This study aimed to find out the effects of handwriting on the academic performance of learners with learning disabilities in selected public primary schools in Nairobi county. Specifically it focused on finding out handwriting characteristics among pupils with learning disabilities, impact of handwriting difficulties on the academic performance of learners with learning disabilities, activities undertaken by the educators to address the challenge of handwriting difficulties among learners with learning disabilities and to find out educators knowledge on factors influencing handwriting development among learners with learning disabilities in Makadara sub-county. The study was based on Logan and Crump two-loop theory of typewriting The study adopted the mixed research design method. The study was conducted in 8 public primary schools in Makadara sub-county. The target population included examiners, language teachers, class teachers, headteachers, and learners with LD. The sample size was 5 examiners, 21 language teachers, 25 class teachers 3 headteachers, and 200 learners with LD. Data were collected using questionnaires, interview guides, and observation checklists. A pretest of the research instruments was done to establish reliability and validity. Data were analyzed using SPSS version 19 and results presented in graphs, tables, and charts. The findings indicated that a majority of the respondents believe that learners with LD can develop good handwriting, over 80% had a perception that handwriting difficulties impacted on the learning behaviors of learners with learning disabilities, over fifty percent strongly agreed that handwriting difficulties affected the academic performance of learners with LD. The study recommended that teachers should acknowledge the existence of handwriting problems in the regular classroom and have a positive attitude towards learners with LD who have handwriting difficulties, acceleration of research on good practices and pedagogies on handwriting development and lastly the need to institutionalize handwriting lessons in the national curriculum as part and parcel of the official learning program.

## **Key words**

**Learning Disability, Academic Performance, Handwriting Difficulty, Assessment**

## **Introduction**

Handwriting is described as a language by hand (Berninger 2008). It is a mirror through which individual creativity, abilities, patience, and organization is reflected. To a large extent, it is a predictor of learning (Kushki et.al, 2011)

Learning disabilities is a disorder in one or more of the basic psychological processes involved in understanding or using a language, spoken or written. It may be manifested in the imperfect ability to listen, think, speak, read, write, spell, or do math calculations. (adapted from the Individual with Disabilities Education Act of America, 2004) Types of learning disabilities include; Dyscalculia which is a difficulty in mathematics facts, Dysgraphia which relates handwriting and fine motor skills, Dyslexia which relates to disorders in reading and language-based skills. Auditory and visual processing disorder is a sensory disability in which a person has difficulties in understanding language despite the normal hearing and vision. Non-verbal Learning Disability, a neurological disorder which originates in the right hemisphere of the brain, causing problems with visual-spatial, intuitive, organizational, evaluative and holistic processing functions (National Joint Committee on Learning Disabilities, NJCLD)

Handwriting difficulties entail having difficulty in developing writing skills and as a result, leads to learners suffering in their educational and emotional development. Handwriting difficulties have to do with the problem of learners expressing thoughts in written form. Mercer et.al, 2011 sites numerous factors that contribute to handwriting difficulties. These include motor problems, such as fine motor and gross motor which will dictate how a learner holds a writing tool, faulty visual perception of letters and words, poor visual memory, poor instrumentation by caregivers and teachers, and lack of motivation both intrinsic and extrinsic.

A variety of handwriting problems are highlighted by the same author which include slowness, incorrect directionality of letters and numbers, too much or too little slant, spacing difficulty, messiness, inability to stay on a horizontal line, illegible letters, too much or too little pencil pressure, and mirror writing.

Handwriting difficulties do not affect general intelligence. Learners experiencing learning difficulties are confronted with extraordinary barriers when it comes to the complex question of mastering writing skills (Bara & Gentaz, 2011). The learners with handwriting difficulties use more energy on motor functions adversely affecting their cognitive functions (Kendel et.al, 2017)

Academic performance refers to educational success, fulfillment, growth, achievement, curriculum performance as per the syllabus. Learners with handwriting difficulties have a lot of challenges in writing to communicate ideas. They may present difficulties in making sentences and using grammatically accepted vocabulary and paragraph organization. This may make it difficult for someone to read their handwriting as some of them write letters and numbers upside down or mirror writing. Most of them have many spelling mistakes in their writing. With these problems, they are always faced with poor academic performance as cited by (Ogano, 2012).

## **Statement of the Problem**

Learning disability question is a complex one although there are limited standardized tools to assist affected learners to overcome the barrier. One tool that appears to hold much leverage in identifying and profiling learners with learning difficulties is the quality of handwriting. A study done by Rasugu 2010 cited the 2008 Kenya Certificate of Primary Education (KCPE) analysis by the Kenya

National Examination Council (KNEC) 2009, which revealed that the performance of learners in English and Mathematics was not good. This was because most of these learners experienced in reading and writing difficulties. According to Rasugu (2010), children with a learning disability are labeled as hard to teach, lazy, slow learners, and careless. This causes teachers in regular schools not to pay attention to such learners due to the negative attitude they have about them.

In the year 2011, the Kenya National Examination Council (KNEC) decried widespread handwriting difficulties/challenges that have made objective marking and examining of some learners' scripts a tough task and subsequently called on teachers to embark on teaching handwriting lessons to help the learners realize their full potentials (KNEC, 2011). It was noted that the success in addressing handwriting difficulties lay with teachers in terms of their capacity, attitude as well as intervention measures, design, and implementation. This had happened against the background of limited standardized methods and curricula to enable teachers to handle the situation. There is, therefore, a need to evaluate handwriting using a valid, reliable, standardized tool combined with the informal observations, teacher observations, and collaboration. Addressing the achievement gap between learners with and without learning disabilities remains a serious challenge in the context of inclusive education. Thus, this study seeks to establish if indeed handwriting difficulties affect the academic performance of learners with learning disabilities in Nairobi county.

### **Purpose and objectives**

The purpose of this study was to assess handwriting difficulties among pupils with learning disabilities and determine its effects on their academic performance in the sub-county of Makadara. The objectives were to find out handwriting characteristics among pupils with learning disabilities, to determine the impact of handwriting difficulties on the academic performance of learners with learning disabilities, to investigate activities undertaken by the educators to address the challenge of handwriting difficulties among learners with learning disabilities and to determine educators knowledge on factors influencing handwriting development among learners with learning disabilities in Makadara sub-county.

### **Methodology**

According to Silverman (2010), the methodology section systematically provides a clear and open depiction of the steps a researcher takes to arrive at findings. A research design is a framework that brings together different parts of the research problem in an organized, systematic, and coherent way (Trochim, 2005). According to Blakstad (2016), research design refers to the overall strategy that a researcher chooses to integrate the different components of the study coherently and logically, thereby, ensuring it effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data.

The research design adopted was two-tier. It employed a mixed research method (Cresswell 2014) since both qualitative quantitative data were to be analyzed. There was also a need to investigate the problem from various angles since there was not much information on the topic available. The quantitative method gives a reliable, statistically verified result. The quality of work of the researcher in such a method can be easily verified while the virtue of the qualitative method is that it allows the researcher to understand what is difficult to isolate and compute with the help of quantitative methods.

**Location of the study**

The study was carried out in Makadara sub-county, Nairobi County. The sub-county has four wards namely; Makongeni/Mbotela, Viwanda, Maringo/Hamza, and Harambee. The sub-county has an area coverage of 20.3 kilometers square. The sub-county has both public and private schools, the number of public schools is 26. However, most of the learners attend public schools that are funded by the government (Nzau, 2017). The sub-county hosts Education Assessment Resource Center (EARC). The center gives a glimpse into the sordid status of the learning facilities in the country. The EARC is supposed to play a leading role in the screening of disabilities. The centers are equipped with the facilities to screen children with visual impairment, mental handicaps, and physical disabilities (Rasugu, 2010).

**Target population**

The study targeted 26 headteachers 532 teachers and 21289 pupils from Makadara Sub-County. Out of this 2000 learners with learning disabilities from class 6 and 7 who had handwriting difficulties were identified and studied.

**Sampling technique**

The study was carried out in 8 selected public primary schools. An equal number of boys and girls were used in this study. Non-probability sampling approach was employed to zero down on a representative study sample. This approach was chosen because the intention of the study was an exploration of handwriting difficulties and not the provision of an in-depth understanding of the problem. Non-probability sampling techniques were handy in getting the necessary study population for this task. Specifically, a purposive sampling technique was deployed in this research. The criteria for inclusion were developed during the pilot stage of the research, and extensive interrogation of the literature. The researcher used checklists adapted from the National Dissemination Center for Children with Disabilities (NICHCY) for identification of learners with learning disabilities and the Minnesota handwriting assessment (1999), a standardized tool for assessing handwriting.

Handwriting assessment was done by learners writing a sentence containing all letters of the alphabet.

**Sample size**

According to Mugenda and Mugenda (2003), a sample size representing 10% of the target population is adequate. The study is limited to pupils and teachers in Makadara Division, Makadara Sub-county, Kenya. From a population of 2000 learners with LD, 200 was picked as a sample size. Out of 532 teachers, 54 teachers were picked as sample size and lastly, 3 headteachers out of 26 were used for the study. The total number of respondents was 254. This sample size was distributed as shown:

### Sample Size Distribution

Category	Population	Percent	Sample size
Examiner teachers	45	10	5
Language teachers	208	10	21
Class teachers	253	10	25
Head teachers	26	10	3
Learners with HD	2000	10	200
<b>Total</b>	<b>2532</b>	<b>10</b>	<b>254</b>

Source; Fieldwork, 2018

### Research instruments

Data was collected using the following instruments;

- Questionnaires
- Interview guides
- Observation checklists

### Data Collection Technique

The researcher proceeded to the field to collect data from the identified sites and maintained a daily log of all activities and deliverables for each day during the data collection. The researcher collected data by use of interview guides, observation checklists, and questionnaires, and tape recorders. Interview guides were used to gather information from headteachers. The researcher tape-recorded the interview and took notes during the interview to avoid losing the information gathered. The recorded interviews were transcribed and information compared with the field notes. Questionnaires were used to collect data from teachers and examiners. The questionnaires were delivered to the teachers on the day agreed upon by the researcher and the respondents. They were collected after they had fully been filled by respondents. Data was collected between October 2018 and January 2019.

### Data analysis

The study yielded both qualitative and quantitative data. This called for qualitative and quantitative data analysis.

The following verbatim by Howe (1992) captures the process involved in qualitative data analysis; Qualitative analysis is about meaning. The social meanings people attach to their experiences, circumstances, and situations, as well as the meanings people embed into texts and other objects, are the locus of qualitative analysis. Therefore, at the heart of their work, qualitative analysis tries to extract meaning from the data. The focus of research is generally words and texts, as opposed to numbers or statistics.

The data collected using semi-structured interviews and observation were analyzed. The recorded interviews were transcribed and each transcription was given a number. A transcript had several lines. These lines were subsequently numbered to facilitate references and retrieval of data. Data captured using observation were coded and filed. The information gathered from reviewed documents was filed instead of the interview case that corresponded to it. A transcript based on data collected using qualitative instruments was made and assigned value. The recurrent themes were identified from the transcripts. The themes were coded based on their similarities and differences. The identified themes were clustered and finally a conversation based on field experience, reviewed literature, and conceptual and theoretical framework for the study.

Quantitative data analysis, by comparison, entailed creating a database using SPSS. This process is about figures, numbers, and graphic representations (Howe, 1992). Consequently, questionnaires were checked for consistency, later cleaning of the questionnaire was done to iron out inconsistencies. Coding was done using SPSS software version 19. This process allowed the generation of graphs, means, percentages, and standard deviation. The resulting descriptive data was subjected to inferential analysis using the Analysis of Variance (ANOVA) technique to ascertain the significance and deviation from the expected mean.

## **Results of the study**

### **Effects of Handwriting Difficulties on the Academic Performance of Pupils with Learning Disabilities**

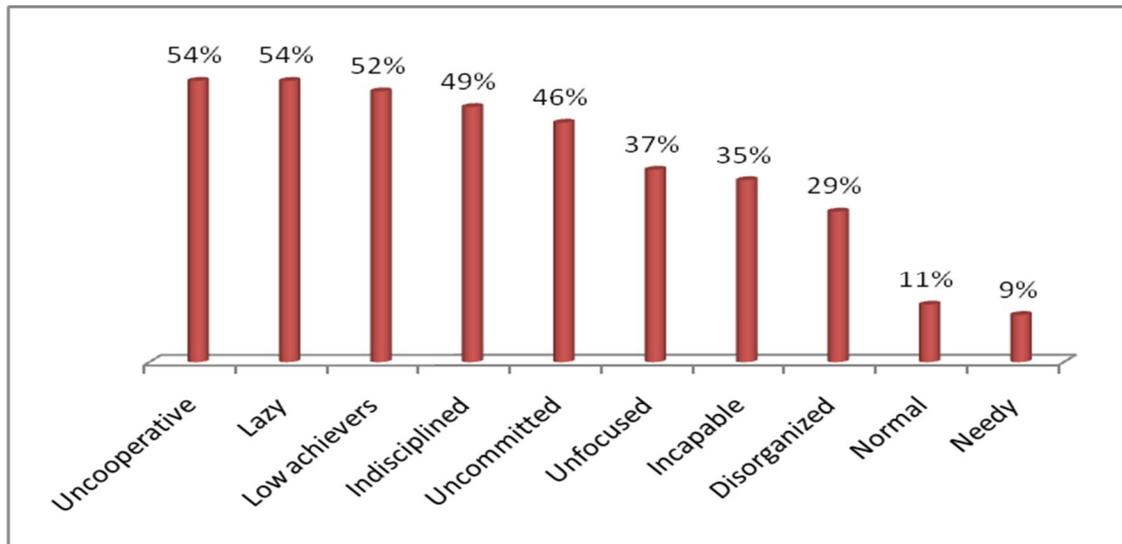
To answer the overarching question on this objective, quantitative data were collected using a questionnaire guide, teachers and learners were involved. The analysis of the objective involved both qualitative and quantitative data that were later subjected to inferential analysis to determine the significance of the hypothesis. Both imperceptible and perceptible learner behaviors were scrutinized to determine if they predisposed or compromised learner's ability to focus on the task at hand. Imperceptible data denoted the effects on composure or confidence in executive tasks. On the other hand, physical behaviors that impinge on school or lesson attendance and average grades or mean scores entailed perceptible effects of poor handwriting. Data on average grades was imperative in testing the hypothesis on the objective to determine their statistical significance. Class means ranging from 2015 to 2017 were compared using ANOVA test to determine how the mean performance of learners experiencing learning difficulties differed from their counterparts without learning difficulties but also beset with handwriting difficulties. The presentation of data on the effects of poor handwriting is preceded by Shield (2013) caution that how we perceive learners to be is what they become in long run, or how learners perceive themselves to be is what they become eventually as described in the subsection below.

### **Teachers' Perception of Learners with Poor Handwriting**

As already mentioned in the preamble, attitudes or perception is a formidable tool in the learning process. It frames the subsequent steps or measures adopted to redress the anomaly (Graham, 2000 & Reid et. al., 2007). Responses on perception were largely negative presenting stakeholders in education a daunting task as only 2% of the respondents perceived handwriting problems positively. Nevertheless, respondents employed pejorative terms when describing learners with poor handwriting. Uncooperative and lazy lots were mentioned on an average basis in each case. Similarly, low achievers, undisciplined, and uncommitted were mentioned on an average. Other demeaning terms used included unfocused, incapable, and disorganized. The only positive words

used to describe learners with handwriting difficulties were ordinary with 11%, needy at 9%, and measily 6% as neglected learners as presented in Figure. More pejorative terms were used to describe learners with handwriting difficulties translating into a negative stance on the phenomena. If learners are perceived negatively, then the problem is more likely to morph into a bigger problem. Poor handwriting should be construed as an opportunity for engagement that accentuates the learning process. It should not stifle learning opportunities and prospects for positive engagement.

**Figure 4.4 Teachers' Perceptions of Learners with Handwriting Difficulties**

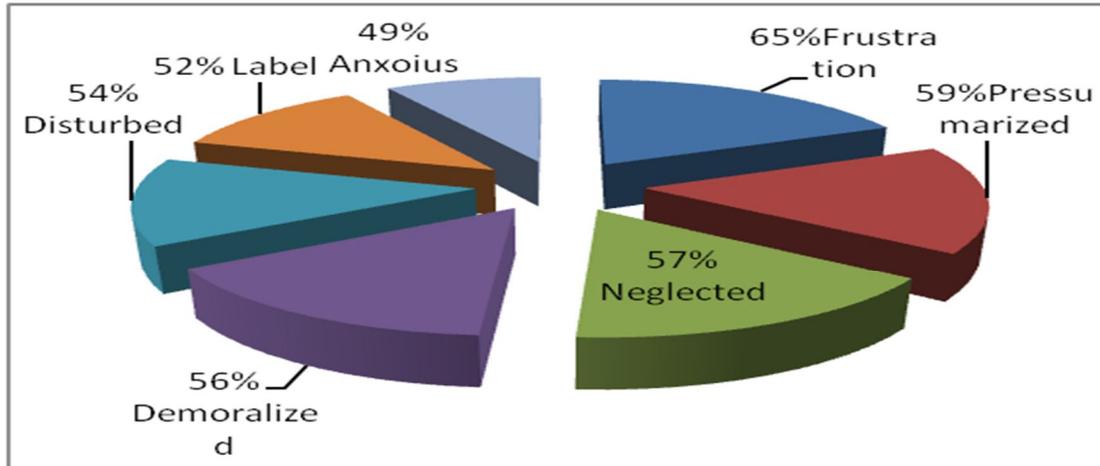


**Source: Fieldwork, 2018**

### Experience of Learners with Poor Handwriting

Ordinarily, the handwriting writing process puts the involved learners under intense pressure. The situation is much more complex for learners grappling with learning difficulty. This cadre of learners is challenged in balancing the demands of cognitive functions and motor functions. Presciently, the data in Figure 4.5 attest to the argument that balancing cognitive and motor functions present an extraordinary challenge to learners with handwriting difficulties. These learners endure lots of frustrations when taking notes according to a majority of the respondents. Some learners feel pressurized, neglected, demoralized and disturbed, stressed, anxious and fatigued according to an average number of the respondents. This experience does not bode well for the learning process. For learners to effectively learn, they must be calm and assert control over their body and cognitive functions. When they become and cede to negative body functions, it means they lack control over their body schema by easily succumbing to external stimuli.

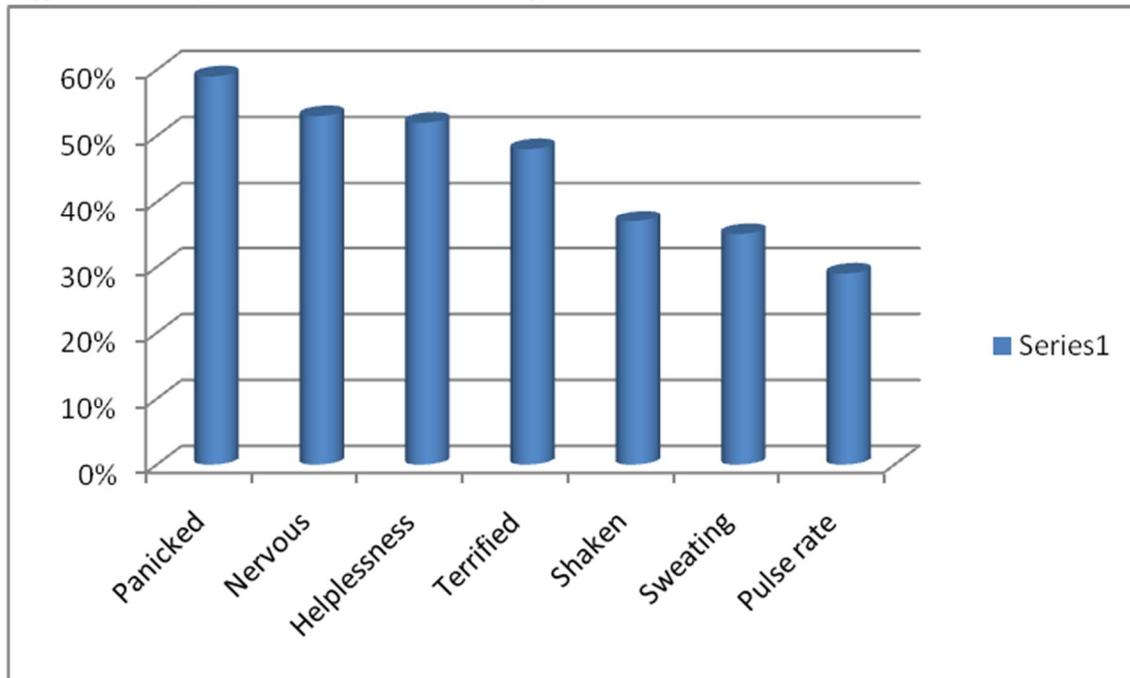
**Figure 4.5 Experiences of Learners with Handwriting Difficulties.**



Source; Fieldwork, 2018

### Response to a Written Assignment

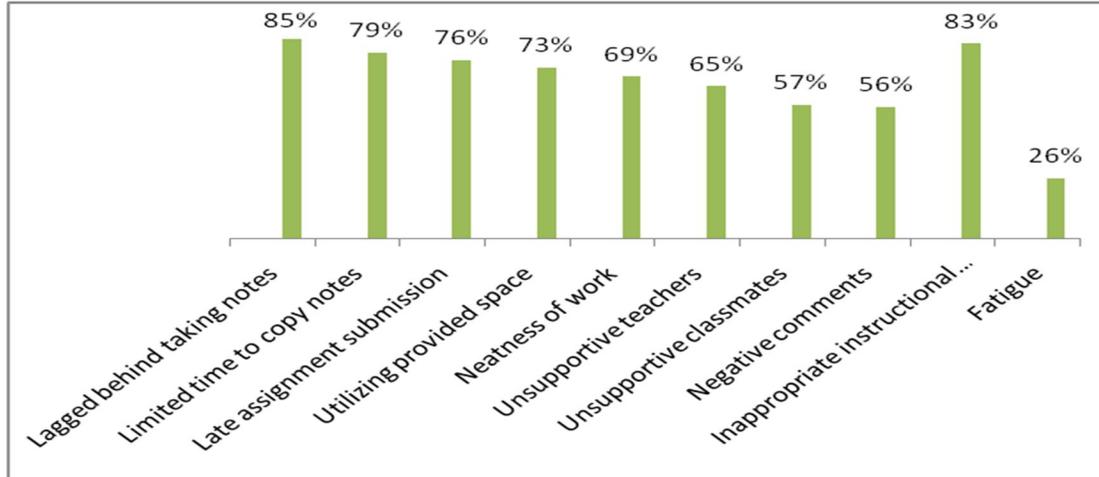
Learners spent over 60% of their time while in school doing pencil and paperwork (Feder, 2007), and even if pencil and paper were to be replaced by writing devices still learners will be obliged to write when answering questions in an examination or filling mandatory forms or documents. In short, free handwriting is inevitable or inescapable. In this vein, respondents were challenged to give their independent thought about how pupils with handwriting difficulties respond to a written assignment. Responding to this question, an average number of the respondents talked about panicking, nervousness and helplessness. Other responses were terrified, shaken, sweating and high pulse rate as summed up with statistics in Figure 4.6

**Figure 4.6 Responses to a Written Assignment**

Source; Fieldwork, 2018

### Challenges Encountered by Learners with Handwriting Difficulties

Learners with poor handwriting face a plethora of problems. These problems ranged from lagging during notes taking exercise, un-presentable work, and more time to write notes or complete assignment, to submitting assignments late as singled out by a majority of the respondents. They also decried the inability to write in the provided space or properly utilize the provided space to be a problem as well as neatness of their work according to an average number of the respondents. Lack of support from the teachers, uncooperative classmates, negative comments from teachers, instructional strategies that were not accommodative were also listed. On the list of problems, there were fatigues, limited instructional materials and lastly limited time to complete tasks as captured in Figure 4.7. The resulting responses suggest that problems learners with poor handwriting largely originate from the inadequate instructional materials and the teacher's practices. In nutshell, instructional strategies and teacher's practices are major protagonists in handwriting development problems.

**Figure 4.7 Challenges Encountered by Learners with Poor Handwriting**

Source; Fieldwork, 2018

### Association between Handwriting Difficulties and Learning Behaviors

Respondents were put to task to echo their perspectives on how handwriting difficulties impacted on a selected aspect of schooling. Among the identified aspects of schooling, we had assignment completion that emerged the most affected. The respondents' perspectives were captured using a Likert scale that illustrates the strongest and most ingrained sentiments on a given study problem. Therefore, averagely, some of the respondents strongly agreed whereas the least somehow agreed that assignment completion was at receiving end of poor handwriting. Apart from assignment completion, the quality of written texts and the quantity of produced texts were rated above 75% each in terms of either strongly agreeing or somehow agreeing. Least popular on Likert scale was class attendance at 25% and sitting position that scored 9% and a summary of this information is found in Table 4.5

**Table 4.5 Problems Encountered by Learners with Poor Handwriting**

<b>Ranking of factors affected</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Can't tell</b>
Assignment completion	55%	35%	11%	3%	1%
Number of written letters	52%	36%	10%	2%	-
Number of written numbers	44%	37%	12%	5%	2%
Quality of written texts	42%	41%	11%	3%	3%
Class attendance	37%	23%	29%	10%	1%
Sitting position	12%	11%	72%	5%	-
Association with peers	5%	2%	83%	8%	2%
Writing speed	45%	23%	28%	3%	1%

**Source; Fieldwork, 2018**

### **Results of a Poor Handwriting**

This item gathered data on how a poor handwriting impact on the physical behavior of the learner while in school and overall impact on classroom learning activities. This is so because if handwriting problems are not properly identified and framed, the situation may culminate into a more intricate problem (Worthington, 2011). Low grades and low participation in learning activities were each ranked first by over 69% of the study problem. The two responses were followed closely by absenteeism and frustration whose response was average. Hardly does poor handwriting result in school dropout as observed by over ninety percent of the respondents who ranked it least. Neither does it lead to indiscipline, fatigue and isolation.

**Table 4.6 Average Score of Learners with Learning disabilities with/without handwriting difficulties**

	<b>Mean Score Performance</b>		
	<b>1<sup>st</sup> Term</b>	<b>2<sup>nd</sup> Term</b>	<b>3<sup>rd</sup> Term</b>
Learners with H/Writing Difficulties	228	243	253
Learners without hand H/W Difficulties	256	321	297

**Source; Fieldwork, 2018**

## **Conclusion**

The study concluded pertinent factors affecting learners with LD who have handwriting difficulties such as quality of handwriting tools which contribute to handwriting development and writing speed which affect handwriting performance. Adequate and poor acquisition handwriting skills involve the spacing of letters and words. Letter/number shape was also found to be a difficulty affecting learners with learning disabilities who have handwriting difficulties. First, the agreement between the joint examination performance and the teacher's categorization of LD learners with handwriting difficulties correlated highly. In addition, the learners with LD without handwriting difficulties performed significantly higher on all the terms of performance component. It was discovered that handwriting difficulty has become a serious problem that hinders learners with LD to express themselves accurately and legibly in a written form. Thus, proper correction is necessary in order to assist learners with LD who have handwriting difficulties.

## **Recommendations to Teachers**

Teachers are major players in the learning process and helping learners acquire good transcriptional skills has a profound impact on their academic achievement. For teachers to productively engage learners with handwriting problems the following recommendations are made.

1. There is a need to acknowledge that handwriting difficulties are part and parcel of the learning process. Acknowledging this will increase acceptance level and demystify fears learners have about the problem leading to constructive and fruitful engagement in finding lasting solutions.
2. Learners with handwriting problems should be construed positively and their situation should accentuate learning rather than stifling it.
3. There is a need for teachers to examine how their own practices and beliefs may be exacerbating handwriting problems and respond by embracing instructional methods that reflect the capabilities and the uniqueness of the learners.

## **Recommendations to Researchers**

Researchers have a crucial and substantive role to play in finding sustainable and acceptable solutions to the problems of handwriting. They have a role to play by;

- i. Accelerating researches on good practices and pedagogies on handwriting development and strengthen information sharing and dissemination mechanisms.
- ii. Develop standard local tools and evaluative procedures to accentuate profiling and helping learners experiencing handwriting problems.
- iii. Expanding research field and document how cultural factors, differences in abilities, individual background, languages and level of technological mastery and resources endowment impact on handwriting process.

**Recommendations to Policy Makers**

Policy framework reflects the official stance on the problem and communicates acceptable norms, practices and offer normative grounds on which the official discussion is conducted. The followings recommendations are therefore made;

- i. There is a need to institutionalize handwriting lessons in the national curriculum and part and parcel of the official learning program.
- ii. Increase incentives to handwriting programs through the official writing competition, designing instructional materials and staff's capacity development programs.
- iii. Find alternative mechanisms of assessing and evaluating learners with handwriting problems to tap the inert potential they could be harboring.

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