



## **EFFECT OF DRILL ACTIVITIES ON HANDWRITING PROFICIENCY AMONG PRIMARY FIVE PUPILS WITH DYSGRAPHIA IN KANO STATE NIGERIA**

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### **Abstract**

This study examined the effect of drills activities on handwriting proficiency among primary five pupils with dysgraphia in Kano State-Nigeria. Two objectives and two hypotheses were formulated for the research. The experimental research of pre-test-post-test control group design was employed. The populations of the study were 110 primary five pupils of Kofar Kudu Primary School of Kano State identified with dysgraphia, with a sample of twenty (20) pupils as a sample of the study. They were selected based on purposive sampling technique. Two instruments were used: Handwriting Proficiency Screening Questionnaire (HPQS) and Michael Handwriting Evaluation Scale (MHES). The Handwriting Proficiency Screening Questionnaire (HPQS) was adopted and identified targeted pupils. Moreover, Michael Handwriting Evaluation Scale (MHES) was adapted and assessed the handwriting proficiency of the sampled population, which were validated using a Cronbach's alpha reliability coefficient and the result showed that the tools were suitable for the conduct of the study, with the reliability index of 0.82 and 0.96 respectively. T-test for independent sample was used and test the 2 hypotheses and analyse the effectiveness of the independent variables over the dependent variable. All the analyses were made using SPSS (version 20) at 5% significant level. The researcher rejected the null hypothesis  $H_0^1$  meaning that Drills activities significantly improved handwriting proficiency among primary five pupils with p-value of .000 at 0.05 level of significant. There is no significant difference in the handwriting performance between boys and girls primary five pupils exposed to drills activities as revealed in the analysis of  $H_0^2$  with p-value of .524 at 0.05 level of significant respectively. It is therefore, recommended that, drills activities improved handwriting proficiency among pupils; teachers should incorporate this approach accordingly.

**Key words:** Drills, Dysgraphia and Handwriting

### **Introduction**

Handwriting is generally the storage of information. The data are written objectively and everyone can use it anytime and anywhere. From the benefits of handwriting, we can refer to the limited amount of data that human memory can hold and the unlimited

amount of data that can be stored in written form. Thus, humans are not only able to learn the knowledge of their ancestors, but also they can use them to achieve new discoveries and new conclusions. Handwriting is an important means of communication that enables expression, recording, and



transmission of students' ideas throughout their educational careers (Dennis & Swinth, 2001; Hamstra-Bletz & Blote, 1993; Tseng & Cermak, 1993). Elementary school children typically spend up to 50% of the school day engaged in writing tasks, some of which are performed under time constraints (Amundson & Weil, 1996; McHale & Cermak, 1992; Tseng & Chow, 2000). A child's ability to write legibly, as well as quickly and efficiently, enables him or her to achieve both functional written communication and academic advancement (Amundson & Weil, 1996; Phelps, Stempel & Speck, 1985; Tseng & Cermak, 1993; Tseng & Hsueh, 1997).

### Dysgraphia

Nicolson & Fawcett, (2011), explained that dysgraphia is the term used by some professionals to describe disorder of written expression and incorporates various aspects, including spelling and handwriting (which includes both *printing/manuscript* and *cursive writing*). They demonstrated, through extensive research, that dysgraphia reflects a lack of automaticity at the cognitive level. To Graham, Harris & Larson, 2001, Marentette, 2011, Nicolson & Fawcett, 2011, IDA, 2012) dysgraphia is defined as difficulty in mastery of writing skills with an impact on the unreadable handwriting. Rosenblum, Aloni & Josman, 2010, Sessoms, 2011, Kusuki, Schwellnus, Llyas & Chau, 2011 reflecting the academic, emotional behavioural and psychological implication. To Schipani (2007) dysgraphia is characterized by very poor hand writing It is often co-exist with other SLDs (Olivia, 2010) while, Prema, (2001) viewed dysgraphia as committing errors in writing.

Individuals with a written expression disorder have significant difficulties in using writing to communicate meanings. They may experience trouble formulating sentences, organising paragraphs, using correct

grammar and punctuations. They may have difficulty generating ideas to write about and can be slow to get their thoughts on paper. Their writing may be disorganized, incoherent and excessively poor. Their ability to spell correctly is often poorly developed. The difficulties in written expression significantly interfere with academic achievement or with daily living activities that require writing skills (American Psychiatric Association, DSM-IV-TR, 2000; Payne & Turner, 1999).

Handwriting difficulty or dysgraphia was defined by Hamstra-Bletz & Blote (1993) as a disturbance or difficulty in the production of written language that is related to the mechanics of writing. It has also been referred to as a specific learning disability (Brown, 1981) the problem is manifested in the inadequate performance of handwriting among children who are of at least average intelligence and who have not been identified as having any obvious neurological problems. Teachers have estimated that 11-12% of female students and 21-32% of male students have handwriting difficulties (Rubin & Henderson, 1982; Smits-Engelsman, Van Galen & Michels, 1995). Dysgraphia or poor handwriting is a common complaint among children and adults with learning disabilities, appearing with or without other academic difficulties (Cratty, 1994; Johnson, 1995; Waber & Bernstein, 1994), as well as in children diagnosed with Developmental Coordination Disorder (DSM-4, American Psychiatric Association (APA), 1994), these are children defined by their teachers as clumsy (Laszlo, 1990; Laszlo, Bairstow, & Bartip, 1988) and children diagnosed with developmental right-hemisphere syndrome (Gross-Tsur, Shalev, Manor & Amir, 1995). In fact, Cratty (1994) found that 30-40% of the surveyed children with learning disabilities had handwriting difficulties.



Going by the preceded explanations, it is apparent that dysgraphia is a specific learning disability that affects writing abilities. It can manifest itself as difficulties with spelling, handwriting and expressing thoughts on paper (National Center for Learning Disabilities, 2009). The International Dyslexia Association (2008) defined dysgraphia as “a specific learning disability that affects how easily children acquire written language and how well they use written language to express their thoughts.” IDA’s position on dysgraphia is so wide that it subsumes extremely poor handwriting into dysgraphia. This condition may reflect other underlying deficits (Deuel, 1995). Poor handwriting may be a manifestation of fine-motor difficulties because the child is unable to execute efficiently the motor movements required to write or to copy written letters or forms. Students may be unable to transfer the input of visual information to the output of fine- motor movements; or they may have difficulty in activities requiring motor and spatial judgments.

### **Handwriting**

Handwriting is the key way through which elementary students convey their thoughts and ideas about what they have learned with their peers and teachers (Case-Smith, 2002; Hammers & Sudsawad, 2004; Woodward & Swinth, 2002). Graham and Harris (2005) supported this view, noting that handwriting is the primary means by which students demonstrate their knowledge in school, but even more important, it provides a flexible tool for gathering, remembering, and sharing knowledge as well as an instrument for helping children to explore, organize, and refine their ideas about a specific subject.

Handwriting refers to the actual motor activity that is involved in writing. Most students are taught manuscript (printing) initially and then move to cursive writing (script) in later grades. Some educators

advocate that only manuscript or only cursive should be taught. In truth, problems may appear among students in either system. Their writing changes as they mature. The focus of a youngster’s writing shifts from (1) the process of writing (handwriting and spelling) to (2) the written product (having written something) to (3) communication with readers (getting across one’s message, Hallahan, Kauffman, & Lloyed, 1999, p. 396). Gargiulo (2004) notes that early on, pupils focus on becoming competent in mastering the mechanical aspects of composition spelling and handwriting; in the later grades, they learn to organize and present their ideas in a lucid and logical fashion. Children with learning disabilities, however, lag behind their nondisabled peers. Investigators have observed that individuals with learning disabilities use less complex sentence structures, incorporate fewer ideas, produce poorly organised paragraphs, and write less complex stories (Gargiulo, p. 219)

### **Drills Activities**

Repetitive practice, along with correct position and pencil grip can help in this process. Handwriting proficiency is mastering a specific skill in learning and other academic activities particularly in the areas of reading, writing and arithmetic. Handwriting proficiency is one of the scholastic skills that children need to acquire to meet the common demands in classroom work at primary school.

Richards (1999), attest that, there are two different approaches to address dysgraphia: Remedial treatment and bypass strategy. Remedial treatments are those that seek to correct handwriting either through direct instruction of handwriting programme. The second strategy is using bypass strategies, such as technology, to find a way around the handwriting difficulties. Compensatory techniques or ways to alleviate the problems would be bypass strategies. Ediger (2002)

suggested that teacher should provide a clear example of good handwriting and then the children should practice and drill using the teacher's model. People with dysgraphia struggle with the display of letters as many times the letter that is asked for in the brain is not the letter that is retrieved and produced (Richards, 1998).

### **Statement of the Problem**

A large number of children with learning disabilities complete primary school unable to write sufficiently well. The reason is that they are not taught appropriately how to write legibly. A student with learning disabilities who has difficulty with handwriting spends more time thinking about letter formation when he or she should be thinking of words or contents to be written. Handwriting difficulty becomes a serious problem for children with learning disabilities as they will not be able to express themselves accurately and legibly in a written form. Research in the field of special education has revealed that, an estimate of about 30-40% of surveyed children with learning disabilities had handwriting difficulties that are commonly observed in children at primary schools particularly in boys. It is in light of this background that, the researcher investigated the effectiveness of drills activities on handwriting proficiency among primary school children with dysgraphia.

### **Objectives of the Study**

This study is aimed at investigating the effectiveness of drills activities as intervention strategy among primary school pupils with dysgraphia. Specifically, the objectives of the study are to:

- i. Determine whether or not drill activities affect the handwriting proficiency of primary school pupils with dysgraphia,
- ii. Find out whether there is gender difference in handwriting proficiency of primary school pupils with dysgraphia when exposed to drill activities,

### **Hypotheses**

During the conduct of the research, the following hypotheses are postulated:

**H<sub>01</sub>** There is no significant difference in handwriting proficiency between primary five pupils with dysgraphia exposed to drills activities and those that are not exposed.

**H<sub>02</sub>** There is no significant gender difference in handwriting proficiency of primary five pupils with dysgraphia who received drills activities.

### **Methodology**

The study adopted experimental research of pre-test – post-test control group design. The pretest – post-test control group design requires at least two (2) groups each of which is formed by random assignment. Both the groups were administered a pretest, each group received a different treatment, and both groups were post-tested at the end of the study (Gay, Mills & Airasian 2009).

For the purpose of this study, all the primary five pupils constituted the population of the study. In other words, all primary five pupils in Kofar Kudu primary school who were identified as having symptoms of dysgraphia served as the population of the study.

**Table 1:** Population of the Pupils

| Name of Schools | School Population |            | Primary 5 Population |           | Number Identified |           |
|-----------------|-------------------|------------|----------------------|-----------|-------------------|-----------|
|                 | Boys              | Girls      | Boys                 | Girls     | Boys              | Girls     |
| Kofar Kudu P.S  | 694               | 318        | 91                   | 61        | 18                | 10        |
| <b>Total</b>    | <b>694</b>        | <b>318</b> | <b>91</b>            | <b>61</b> | <b>18</b>         | <b>10</b> |

(Source: Schools Enrollment Records, 2017/2018 academic session)

The sample size of this study comprises of thirty pupils with dysgraphia (boys and girls) were selected using the Handwriting Proficiency Screening Questionnaire (HPSQ) each of the two groups have ten (10) participants each. There is no general rule regarding what sample size a researcher should use as opined by Bichi, (2004) that the ultimate size a researcher uses depends upon a number of factors: the nature of the study, the instruments to be used, and the nature of the population and so on.

Purposive non-probability sampling technique was employed as the sampling technique of the research which is a process of selecting a sample that is believed to be representative of a given population. In other words, the researcher selects the sample using his experience and knowledge of the group to be sampled (Gay, Mills & Airasian 2009).

In the conduct of this research, two instruments were employed. These instruments are: Handwriting Proficiency Screening Questionnaire (HPQS) which was used to identify pupils with dysgraphia while Michael Handwriting Evaluation Scale (MHES) was used to assess pupils' handwriting proficiency respectively.

The intervention period lasted for a half hour (i.e the length of the sessions), two days per week (Mondays and Tuesdays) for eight weeks, the weekly contact was between 9:30 – 10:00 Am. The experimental group

received the exposure of drills activities. The procedure of intervention for the experimental and control groups begins with administering the Michael Handwriting Evaluation Scale to have the pre-test scores and end with administering the same instrument for post-test scores .

Drills activities were constantly repeated handwriting activities aimed at helping the hand of the pupils with dysgraphia to write enough so that their handwriting would hopefully become more fluent and automatic. Pupils were given repeated writing practice so that their handwriting can be improved. At the beginning of the intervention, pupils were provided with exercise books (2D) and practice alphabet letters A to Z with different set of letters to each session beginning with capital letters followed by small letters. The researcher demonstrated how to write the letters using the same book and verbally stating how to write letters along with correct position and pencil grip. However, as Ediger (2002) suggested that using drills activities as an intervention strategy to improve handwriting proficiency among children with dysgraphia, the teacher should provide a clear example of good handwriting and then the children should practice and drill using the teacher's model. Repetitive practice, along with correct position and pencil grip can help with this process.

To this end, the participants were also provided with exercise books (2A), the research assistants write the



sentences/exercises which were drawn from Handwriting Book published by Oxford University Press, and then the pupils were asked to write the selected sentences as many as possible up to the end of the session period. This repeated writing practice activities were continued with each session having different sentence to practice by the pupils throughout the intervention period.

The researcher administered the MHES to all participants in the school. All the participants used English language as their official verbal and written communication. They used their right hand when writing exercise. Handwriting Proficiency Screening Questionnaire (HPSQ) served as the identification instrument of children with dysgraphia.

Michael Handwriting Evaluation Scale (MHES) has two parts, dictation and copying from the board. The dictation part has five (5) exercises and a space below each exercise is provided for the pupils to write the exercise. The copying from the board has two (2) exercises. Pupils were required to write these

exercises on the space provided on the instrument. Hence, the evaluation was based on Readability, Spatial organization, Line straightness, Size and Spacing. Both the control and experimental groups were pre-tested using this instrument and then the experimental group was exposed to treatment and then the two groups were post-tested using the same instrument (MHES) and were scored immediately to determine the effect of the independent variables on the study sample. t-test for independent sample was used to test the research hypotheses. All statistical analysis was performed using the SPSS version 20. The researcher made a comparison on the performance of the two experimental groups against the control group and the difference was accepted and rejected at p 0.05 level of confidence.

## Results and Discussion

### Hypothesis Testing

**H<sub>01</sub>** There is no significant difference in handwriting proficiency between primary five pupils with dysgraphia exposed to drills activities and those that are not.

**Table 1: Result for difference in handwriting proficiency between Exp1 (Drills) and Control (N=20)**

| Variables       | N  | Mean  | SD   | df | t-cal | p-value | Sig  | Decision                             |
|-----------------|----|-------|------|----|-------|---------|------|--------------------------------------|
| Expr 1 (Drills) | 10 | 35.50 | 1.64 | 18 | 24.13 | .000    | 0.05 | H <sub>0</sub> <sup>1</sup> Rejected |
| Control         | 10 | 10.00 | 2.90 |    |       |         |      |                                      |

The table 1 above shows the differences in handwriting proficiency among pupils with Dysgraphia, Experimental Group 1 (exposed to drills activities) and the Control Group (offered no treatment) T-test for independent sample was used to compare between the two groups. The post-test data of Experimental group shows the mean of 35.50 with SD of 1.64, while the post- test data of Control group shows the mean of 10.00 with SD of 2.90. The test showed t-cal value of (.000, p 0.05>.000). The result of the test concludes

that there is a significant difference between the variables under study  $p > 0.05$  therefore, the null hypothesis which states that there is no significant difference in handwriting proficiency between primary five pupils with dysgraphia exposed to drills activities and those not exposed to it, is therefore rejected in favour of the alternate hypothesis which says that there is significant difference in handwriting proficiency between primary five pupils with dysgraphia exposed to drills activities and those not exposed to it.



## Hypothesis Two

**Ho2** There is no significant gender difference in handwriting proficiency of primary five

pupils with dysgraphia were exposed to drills activities.

**Table 2: Result for difference between boys and girls in the handwriting proficiency at Kofar Kudu Primary School (N=10)**

| Variables | N  | Mean  | SD   | df | t-cal | p-value | Sig  | Decision                             |
|-----------|----|-------|------|----|-------|---------|------|--------------------------------------|
| Boys      | 05 | 35.00 | 2.00 | 8  | -.667 | .524    | 0.05 | H <sub>0</sub> <sup>2</sup> Accepted |
| Girls     | 05 | 35.80 | 1.78 |    |       |         |      |                                      |

Table 2 above shows the gender difference in handwriting proficiency of primary five pupils with dysgraphia who received treatment using drills activities. They were all subjected to drills activities. The post-test data of boys shows the mean of 35.00 with SD of 2.00, while the posttest data of girls shows the mean of 35.80, SD of 1.78. The test showed p-value -.667 at the probability value of .524. The result of the test concludes that there is no significant difference between the variables under study  $p > 0.05$ . The null hypothesis which says there is no significant gender difference in handwriting proficiency of primary five pupils with dysgraphia who received treatment using drills activities is therefore, accepted.

## Discussions on Findings

The finding of the first research hypothesis showed the obtained t-value of 24.13 as significant at 0.05 level of confidence. A comparison of the performance of pupils with dysgraphia (experimental and control) at pre and post-test was made and the results proved that there is a significant difference between the performance of the control and experimental group at the post-test in favour of the experimental group, while no difference was noticed at pre-test. This illustrates that drills activities had significantly triggered changes in the handwriting proficiency of primary five pupils with dysgraphia. The finding rejected the null hypothesis and accepted the alternate hypothesis. The finding of the current study

is supported by several researches. For example, Suyansah (2014) conducted a study titled “Employing Drilling Technique in Teaching English Writing Skills to a Group of Rural Malaysian Students”. 20 samples were selected. The comparison of the pre- and post-test scores of the control and the treatment groups also demonstrated that the treatment group obtained a higher mean than the control group. However, findings showed that the drilling technique employed leads to improvement in the learners’ writing performance. This was further established by Rosenblum et al., 2001; Smits-Engelsman & Van Galen, 2001. The results of these researches have shown that poor writers had improved their performance through the use of different strategies in the package with constant practice (drills activities) Ediger (2002) suggested that the teacher should provide a clear example of good handwriting and then the children should practice using the teacher’s model. (Richards, 1998) Repetitive practice, along with correct position and pencil grip can help with this process.

A comparison of boys and girls with dysgraphia (experimental) was performed and the post-test result illustrates that there is no significant difference in the handwriting proficiency between the performance of boys and girls primary five pupils with dysgraphia at the post-test as the obtained t-value -.667 at 0.05 level of confidence. This leads to the acceptance of the null hypothesis that there is



no significant difference in the handwriting proficiency between primary five boys and girls with dysgraphia who received the intervention of drills activities. Mamman (2006) in a study titled effect of clinical teaching on handwriting skills of dysgraphic JS 1 Students in Katsina State of Nigeria found that there is no significant difference between the performance of male and female students with dysgraphia.

### Conclusion

The findings of the research also concluded that drills technique is effective on improving handwriting proficiency among primary five pupils with dysgraphia in Kofar Kudu Primary Schools, because the experimental group Exp1 demonstrated remarkable improvements after being exposed to the treatment. Therefore, the null hypotheses  $H_0^1$  was rejected. The research findings further revealed that there is no significant difference between male and female pupils with dysgraphia exposed to drills activities in Kofar Kudu Primary School. This leads to the acceptance of null hypotheses  $H_0^2$ .

### Recommendations

Based on the findings of the study and to improve handwriting proficiency among school children, the study recommends the following:

1. That all pupils with dysgraphia should be identified in their schools so that teachers can devise ways of handling them through the use of drills.
2. That all teachers should be sensitized on symptoms of dysgraphia through training so as to make it easier for such teachers to identify and remediate such pupils
3. Workshops for Special Education teachers and by extension regular teachers of children should be organized to educate them on how to manage children using several

techniques of improving handwriting proficiency among teeming number of pupils with dysgraphia in mainstreamed classrooms of public schools particularly using drills activities.

4. Parents of children with dysgraphia should provide handwriting training to their children at home by using drills activities. This could be done after official school hours, at weekends and during holidays. It will go a long way in improving handwriting proficiency among their children.

### References

- American Psychiatric Association, DSM-IV-TR. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Amundson, S.J., & Weil, M. (1996). Prewriting and handwriting skills. In J. Case-Smith, A.S. Allen, & P.N. Pratt (Eds.) *Occupational therapy for children* (pp. 524-541). St, Louis, MI: Mosby-year book.
- Bichi, M. Y. (2004). *Introduction to research methods and statistics*, Kano: Debis-co Press & Publishing Company.
- Case-Smith, J. (2002). Effectiveness of school-based occupational therapy intervention on handwriting. *American Journal of Occupational Therapy*, 56, 17–24.
- Cratty, B. J. (1994). *Clumsy Child Syndromes: Descriptions, evaluation and remediation*. USA: Harwood Academic Publishers.
- Dennis, J. L., & Swinth, Y. (2001). Pencil grasp and children's handwriting legibility during different length writing tasks. *The*



- American Journal of Occupational Therapy*, 55, 171- 183.
- Deuel, R.K. (1995). Developmental dysgraphia and motor skills disorders. *Journal of Child Neurology*, Special Supplement, 10 (1): 6 – 8.
- Ediger, M. (2002). Assessing handwriting achievement. *Reading Improvement*, 39, 103-110.
- Gargiulo, R. M. (2004). *Special education in contemporary society: An introduction to exceptionality*. Belmont, CA: Thompson-Wadsworth.
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2009). *Educational research: Competences for analysis and application* (9th ed.). New York: Macmillan Publishing Company.
- Graham, S., & Harris, K. R. (2005). Improving the writing performance of young struggling writers: Theoretical and programmatic research from the Center on Accelerating Student Learning. *Journal of Special Education*, 39(1), 19–33.
- Gross-Tsur, V., Shalev, R.S., Manor, O. & Amir, N. (1995). Developmental right hemisphere syndrome; Clinical spectrum of the nonverbal learning disability. *Journal of Learning Disability* 28, 80-86.
- Hallahan, D. P., Kauffman, J. M., & Lloyd, J. W. (1999). *Introduction to learning disabilities* (2nd ed.). Boston: Allyn & Bacon.
- Hammers, S. L., & Sudsawad, P. (2004). Teachers' survey on problems with handwriting: Referral, evaluation, and outcomes. *American Journal of Occupational Therapy*, 58, 185–192.
- Hamstra-Bletz, L., & Blote, A. (1993). A longitudinal study on dysgraphic handwriting in primary school. *Journal of Learning Disability*, 26, 689–699.
- International Dyslexia Association. (2012). *Dysgraphia*. Retrieved April 10, 2015, from [www.interdys.org/ewebeditpro5/upload/Dysgraphia.pdf](http://www.interdys.org/ewebeditpro5/upload/Dysgraphia.pdf)
- Johnson, D.J. (1995). An overview of learning disabilities: Psycho educational perspectives. *Journal of Child Neurology* 10, S2-S8
- Kusuki, A., Schwellnus, H, Ilyas, Ilyas, F & Chau, T (2011), Changes in Kinetics an kinematics of hand writing during prolonged writing task in children with and without Dysgraphia, *Research in Developmental disabilities*, 32
- Laszlo, J. I. (1990). Child perceptual-motor development; *Normal and abnormal development of skilled behaviour*. In C. A. Hebert (Ed.) *Developmental Psychology: Cognitive, perceptual-motor and neurophysiological perspective. Advances in psychology* (pp. 273-308). Amsterdam: North Holland.
- Laszlo, J. I. Bairstow, P.J., & Bartip, J. (1988). A new approach to treatment of perceptual-motor dysfunction: previously called clumsiness. *Support for Learning* 3, 35-40.



- Marentette, P. (2011). What is dysgraphia? <http://en.wikipedia.org/wiki/dysgraphia>.
- McHale, K., & Cermak, S. A. (1992). Fine motor activities in elementary school: 31 Preliminary findings and provisional implications for children with fine motor problems. *American Journal of Occupational Therapy* 46, 892-898.
- Mamman, S. (2006). Effect of Clinical Teaching on Dysgraphic Learning Disabled Junior Secondary 1 Students in Katsina State. Unpublished Ph.D. thesis, Bayero University, Kano.
- National Center for Learning Disabilities. (2005). *Guide to frequently asked questions: Individual with Disabilities Improvement Education Act*. Washington, DC: Author.
- Nicolson, R.I., & Fawcett, A.J. (2011). Dyslexia, dysgraphia, procedural learning and the cerebellum. *Cortex*, 47, 117-127. doi:10.1016/j.cortex; from <http://ldatschool.ca/literacy/literacy-skills> handwriting/retrieved:22/11/2015
- Payne, T., & Turner, E. (1999). *Dyslexia: A parents' and teachers' guide*. Clevedon, North Somerset, UK: Multilingual Matters.
- Phelps, J., Stempel, L., & Speck, G. (1985). The children's handwriting scale: A new Diagnostic tool. *Journal of Educational Research* 79, 46-50.
- Prema, R (2001). Development of Remedial Instructional Programme for Elementary School Children with Writing Disabilities in English. Unpublished Doctoral Dissertation, Regional Institute of Education, 2002, Mysore.
- Richards, R. (1998). *The writing dilemma: Understanding dysgraphia*. Riverside, CA: Richards Educational Therapy Center.
- Richards, R. (1999). *The source for dyslexia and dysgraphia*. East Moline, IL: Lingui Systems.
- Rosenblum, T., & Josman, N. (2010). Relationships between handwriting performances and organizational abilities among children with and without dysgraphia: A preliminary study. *Research in Developmental Disabilities*.
- Rubin, N., & Henderson, S. E. (1982). Two sides of the same coin: Variation in 33 teaching methods and failure to learn to write. *Special Education: Forward Trends* 9, 17-24.
- Schipani, D. (2007). *Check The Fine Point*. *Scholastic Parent and Child*, 15(2) 79.
- Smits-Engelsman, B.C.M., Van Galen, G.P., & Michels, C.G.J. (1995). Teachers' assessment of the motor proficiency level and motor writing skills of elementary school pupils. In B.C.M. Smits-Engelsman. *Theory based diagnosis of fine motor coordination development and deficiencies using handwriting tasks* (pp. 33-49). Unpublished Doctoral thesis. The Netherlands: University of Nijmegen.
- Suyansah, S. (2014). *Employing Drilling Technique in Teaching English Writing Skills to a Group of Rural Malaysian Students*. School of



Education and Social Development:  
University Malaysia Sabah,

Tseng, M. H., & Cermak, S. H. (1993). The influence of ergonomic factors and perceptual - motor abilities on handwriting performance. *American Journal of Occupational Therapy* 47, 919-926.

Tseng, M. H., & Hsueh, I. P. (1997). Performance of school-age children on a Chinese Handwriting Speed Test. *Journal of Occupational Therapy International* 4, 294 - 303.

Waber, D. P., & Bernstein, J. H. (1994). Repetative graphomotor output in L.D. and Nonlearning-disabled children. The Repeated Patterns Test. *Developmental Neuropsychology* 10, 51-65.

Woodward, S., & Swinth, Y. (2002). Multisensory approach to handwriting remediation: Perceptions of school-based occupational therapists. *American Journal of Occupational Therapy*, 56, 305–312.