

Pre-handwriting Skills Learners Should Master at the Beginning of Grade 1

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Abstract

The current curriculum of the South African Department of Education, Curriculum Assessment Policy Statements (CAPS), prescribe handwriting to be taught in the subject Home Language. According to CAPS, a pre-handwriting program should be followed before formally teaching handwriting in the Grade 1 classroom. Yet, the curriculum does not prescribe a specific pre-handwriting program.

I undertook this qualitative research project to explore Grade 1 teachers' experiences of their learners' challenges with pre-handwriting skills. Data was generated during two focus group interview sessions. The data consist of my own notes taken during the interviews, audio recordings of the focus group interviews, which yielded data rich discussions among the teacher participants, teachers' field notes from the classroom and evidence from the learner participants' workbooks. The transcribed focus group discussions were analyzed and coded by hand. The four main themes (with sub-themes indicated in brackets) that emerged are: Fine motor skills (Pencil grip and Letter formation), Visual memory (Reversals, direction and space), Intrinsic physical aspects (Low muscle tone and Midline crossing) and Extrinsic environmental aspects (Seating position, Writing tools, and Teacher training). I recommend that the identified challenges be used as the basis of a pre-handwriting program that will fill the void in the CAPS policy document. Such a program should include daily activities and the duration thereof stipulated for use in the Foundation Phase classroom.

1. Introduction

Despite the increasing popularity of technology, handwriting remains a vital skill at school level [1]. Several handwriting programmes have been developed to support the significance of handwriting in the Foundation Phase, because the physical task of writing makes the learner mindful of differences in letters. This awareness improves reading fluency. Handwriting is viewed as a predictor for possible academic achievement [2,3,4] due to the complex nature thereof. It is in the earliest grades of the Foundation Phase, in Grade R and Grade 1, where the perceptual skills pertaining to handwriting are attained. A set method for handwriting instruction

could not be found in the wide array of literature consulted, and certainly no handwriting program that was developed in South Africa, based on sound research. Some of the widely used handwriting programmes will be discussed here.

The *Write Start* handwriting programme is an intervention programme, used for increased writing fluency and legibility. This programme is evidence that learners benefit when teachers and Occupational Therapists (OTs) work in tandem.

Handwriting Without Tears was developed to enable parents to assist learners at home, as an extension of the assistance teachers are offering at school.

The *Handwriting Without Tears* programme was extended to the *Handwriting Without Tears – Get Set for School* (HWT-GSS) programme. The aim of this programme is to help young learners develop prewriting skills through playing, and singing, and developing motor skills, body awareness skills, cognitive and language skills, sensory processing and visual-perceptual skills, as well as social and emotional development. These programmes focus on the child's development of spatial awareness, visual motor perception and fine motor coordination; factors that help the child to develop the basic skills for academic progress and reaching developmental milestones.

2. Background

It was typical up to the early 1990s for learners in the United States of America (USA) that experienced difficulties with fine motor skills to be referred to occupational therapists. This practice was supported by the Disabilities Education Act (IDEA) of 1990 and the Disabilities Education Act (DEA) of 1990 Law 101-476). In 2004, this law was expanded to make provision for collaboration between the educator and specialists to benefit learners with special needs [5].

Researchers had found that learners in an elementary classroom spent 30-60% of their time in the classroom on fine motor activities, and the biggest part of this time, was spent on handwriting tasks [6]. These researchers argued that if so much time is spent on fine motor activities, it would impact negatively emotionally, as well as academically, on the learner experiencing difficulties.

It is now nearly three decades later, no drastic changes to the learners' school day have been made.

Jane Case-Smith [7] took the initiative to invite OTs into her classroom, where the OTs could assist the learners that presented with fine motor difficulties, with reported positive results. OTs identified the need for teachers to understand how learners learn to write, to enable the teachers to assist the learners more comprehensively.

The *Pediatric Assessment of Disability Inventory* (PEDI, 1992) model of evaluation was designed and is still being used today to evaluate motor outcomes, such as mobility, strength and self-care tasks involving fine motor skills [7, 8]. It would seem that in the USA, as well as in South Africa, the aim is for the teacher to assist the learner as far as possible in the classroom, but once it becomes evident that more specialised help is needed, the learner is referred to an OT.

3. The South African context

The South African inclusion policy [9, 10] give clear guidelines on how the teacher should provide evidence of assessments done by the teacher, and also attempts by the teacher and the school to assist struggling learners. Once this avenue has been exhausted, the Department of Education will lend assistance to learners to be evaluated by a therapist. It is important to note that, even when learners are referred for therapy, they might not have immediate access to such a therapist. The frequency of therapy sessions might also not be as often as the intervention program would require, because of the remote areas in which some learners find themselves.

However, two factors exist to hamper some Grade 1 learners to achieve optimally in their first year of formal schooling. The first factor is that it is not compulsory for young children to attend a Reception Year, or Grade R, as it is also called. Grade R is the year in which a perceptual-motor program is followed, and without this exposure, the learner's perceptual skills and fine motor skills might be underdeveloped [11].

The second factor is that the South African Department of Education [12] allow learners to enter formal schooling at age 5, turning 6 before the 30th of June of the year, or age 6, turning 7 in the same year. The result of these two factors is that an age difference of up to 2 years can be found in a Grade 1 classroom [13]. By the middle of the year, it appears as if up to one-third of Grade 1 learners are underachieving in reading, writing and mathematics [11]. Therefore it is vital that the young learners starting Grade 1, be exposed to a pre-handwriting program to curb the deficit of not having had exposure to a perceptual-motor program.

4. Pre-handwriting skills

According to Bronfenbrenner's ecological systems theory, the young learner's development is affected by the social and learning environment. In order for young learners to learn to write formally, skills such as a correct pencil grip, drawing, writing, copying and colouring need to be mastered. Pre-writing shapes provide the formation strokes of most letters. These strokes are age specific, and are usually achieved in this specific order.



Figure 1. Fundamental pre-handwriting strokes

Dinehart [3] opines that the young child typically experiments with writing from the age of 2 years, but has matured sufficiently into formal handwriting instruction once the oblique cross has been mastered, because of the element of midline crossing. Difficulties in crossing the midline can result in reversals such as 6/9, f/t. In the exchange between the microsystem and the mesosystem, as described by Bronfenbrenner, school and home need to work together to assist the learner experiencing challenges with pre-handwriting skills.

5. Research methodology

In this qualitative research study, three urban schools have been selected as participants because they are well resourced in terms of the institutions' ability to provide, or arrange for the provision of specific writing utensils and corrective measures, such as aids to ensure correct pencil grip. These schools are also well equipped with outdoor play areas, educational toys and teaching materials that support perceptual activities. The three participating schools go to great length to ensure that the teachers they employ are suitably qualified and have studied at reputable tertiary institutions. Eight Grade 1 teachers from these schools participated, and they identified ten learners in total that presented with difficulties with pre-handwriting skills. Sample selections was, therefore, purposive. The aim was to conduct the research project in the learners' natural setting with absolutely no mention or emphasis on the project. This was the reasoning for me, as researcher, not to visit their classrooms. Therefore, the ten learners were not even aware that they were participants in a project, although written consent had been obtained from their parents and school authorities beforehand.

The teachers taught and assisted all the learners as usual without singling out the participants. A focus group interview was held with the teacher participants from two schools, and the following week with the four teachers from the remaining school. I took notes

during the interviews, as well as audio recordings, which were transcribed verbatim. Phenomenological data collection methods were used where the teachers brought along evidence in the form of the learners' workbooks, field notes from the classroom and photographs to the focus group interview. The data was analyzed and, as shown by Braun and Clarke [14], themes and patterns emerged which enabled me to come to a meaningful conclusion.

6. Findings and discussion

The focus group discussions were transcribed verbatim, re-read and then read by the participants and signed off as a true reflection of the discussions. For the identification of specific themes from the varied data, I used a thematic analysis approach. The purpose was to learn what the challenges were related to learners' pre-handwriting skills. As advised by Braun and Clarke [14], I familiarized myself in depth with the data. I continued by seeking out themes that recurred as challenges. The themes that recurred most often were coded as significant. The inductive or bottom up approach was used as it conveyed the learners' real-life experiences. By referring to the notes I have made during the focus group discussions, and by scrutinizing the transcriptions, I was able to pick up on the nuances and outcomes of discussion points and report on the lived experiences. Once I had established and confirmed the main themes, I could sort the rest of the themes that gel with the main themes, as sub-themes.

Theme 1 Fine Motor Skills	Sub-themes Pencil grip and Letter formation
Theme 2 Visual Memory	Sub-theme Direction, space and reversals
Theme 3 Intrinsic Physical Aspects	Sub-themes Low muscle tone and Midline crossing
Theme 4 Extrinsic Environmental Aspects	Sub-themes Seating position, Writing tools and Teacher training for Grade R

Figure 2. Identification of themes and sub-themes

6.1. Theme 1: Fine motor skills

Four themes and eight sub-themes have emerged from this research project as challenges experienced by Grade 1 learners in pre-handwriting skills. A visual layout is seen in Table 2 above.

Cameron and his colleagues [15] report that typical fine motor assessments include visual,

cognitive and skillful handedness. An example of such a demand would be to copy an image onto paper or to make a block construction. The Grade 1 teachers reported challenges with fine motor skills as ineptness with puzzle construction, clumsiness when working with clay, and difficulties to pick up the pins of the pegboard. Intervention strategies by the teachers included the tearing of paper, using the small torn pieces of paper to create a picture, finger exercises and the stringing of beads.

6.1.1. Sub-theme: Pencil grip: Schweltnus *et al.* [16] explain three pointers when categorizing pencil grip: the placing of the thumb, the number of fingers on the shaft of the writing utensil, and the stance of the finger joints. A static pencil grip will cause pain and fatigue, due to the excess amount of pressure applied.

The pencil grip described as ideal is called the dynamic tripod grip (DT) [16]. In the DT, the thumb is placed opposite the index finger, on opposite sides of the pencil, and the pencil rests lightly on the middle finger for support. This positioning of the fingers and joints allows for nimble movement of the fine muscles to create letters. It is important to note that the DT applies to both left- and right-handers (See figure 2). A static pencil grip inhibits wrist extension. An example of a static pencil grip would be what causes a learner to make the downward stroke of the "r", and then lifting the hand to form the upper curve. The learner is therefore unable to continue upward directly after making the downward stroke, and from the upward stroke, go into the curve of the "r". The eight teacher participants all reported that most of the learners in their classrooms displayed less effective pencil grips, not only the ten learner participants. The teachers ascribe this to the fact that young children imitate their parents, and often sit opposite their parents when writing takes place, which gives a reversed view of the pencil grip. However, some teachers reported that the DT pencil grip is seemingly not enforced at pre-school level.

The teachers have had a measure of success assisting learners with pencil grip difficulties by employing commercially available pencil grips. The soft, rubber aids fit over or around the pencil and guide the learner in finger placements.

6.1.2. Sub-theme: Letter formation: We can see just how complicated the act of handwriting is from Shaw's [17] description of letter formation. Firstly, the young learner needs to be in control of the fine motor muscles. Secondly, the young learner should have good eye-hand co-ordination. Thirdly, the learner should be able to cross the midline, the imaginary vertical line that divides the body into symmetrical halves. Fourthly, the learner must be able to use the dominant hand, hold the pencil, and make a mark on paper that constitutes a letter.

The challenges reported by the teacher participants can thus be ascribed to the learners not having mastered these four aspects of letter formation, which lead to the learners starting from the wrong position when writing the letter. Difficulties with eye-hand co-ordination resulted in learners being unable to follow the straight and curved dots when learning to write the letters of the alphabet. Teacher participants reported incorrect letter formation in the form of the “e” that is started as a “c” and then completed to resemble an “e”. Also the “g” that is formed as an “o” in a clockwise formation. The hand is lifted to add the tail.



Figure 3. The tripod grip for left- and right-handed learners.

6.2. Theme 2: Visual memory

Visual memory is the ability to recall information that has been perceived through the eyes. Therefore, if learners are unable to remember what they have seen, they will struggle to copy from the board, or text next to them. This will result in difficulties with letter formation, and also reading and writing difficulties, as pointed out by Coetzee and Gerber [18]. It is not difficult to deduct from this, that a lack in visual memory will have a negative impact on work pace.

Discrepancies in visual memory was noticed by the teacher participants where learners were unable to reproduce three basic geometric shapes onto a pegboard, incorrect letter formation of the “n” and “s”, as well as the omission of the first downward stroke in the “m”.

6.2.1. Sub-theme: Reversals, direction and space:

Richmond and Taylor [19] caution that some reversals and left-right confusion are normal up to the age of seven, due to the maturation of the nervous system. Reversals reported by the teacher participants were the typical “b” and “d” reversal, which teachers often attempt to curb with the use of stories or rhymes, e.g. the “b”: *first the bat and then the ball*, to show the downward stroke and then the round stroke. The

incorrect letter formation of “n”, “s”, “e” and “g” as reported, could also be ascribed to direction and space, or spatial orientation. Spacing refers to spaces left between words to separate the words, and also even spacing between letters within a word. Spatial orientation makes it possible for learners to write within lines.

6.3. Theme 3: Intrinsic physical aspects

The teacher participants identified intrinsic physical traits that I will discuss under two subheading: low muscle tone and midline crossing problems.

6.3.1. Sub-theme: Low muscle tone: Goo, Johnston and Tucker [20] describe muscle tone as the individual’s readiness to respond to gravity. The teacher that identified the learner with low muscle tone said it was quite obvious that something was amiss, because the learner would slump when seated, whether in a chair or on the carpet. He seemed to have a droopy posture when walking, and when seated on the carpet he would lean against the wall or a friend. The teacher found it advisable to enlist the help of the parents in encouraging the learner to become physically active, and at school, she enlisted more frequent physical movement activities.

6.3.2. Sub-theme: Midline crossing: Learners that find it difficult to cross their midline will only write from or to a certain point on the page. If they do cross the margin they have unknowingly set for themselves, the size of their writing will increase. The teacher participants reported that they employ the “Lazy 8” exercise from Brain Gym®, as well as crossover exercises to encourage learners to cross their midline. An example of a crossover exercise would be for the learners to touch their right knee with the left hand, alternating with the left knee touched with the right hand. Some crossover exercises involve stretching, and the teachers reckon that the stretching seem to have a calming effect on the learners.

6.4. Theme 4: Extrinsic environmental aspects

Environmental factors can greatly influence the learners’ pre-handwriting skills, yet the learners do not have control over these factors. Reported factors included seating position, writing tools, and teacher training.

6.4.1. Sub-theme: Seating position: Left-handed learners should be seated on the left-hand side of the desk, if the desk is shared. This allows space for the turning of their book approximately 45 degrees to the right, whereas a right-handed learner will position their book approximately 45 degrees to the left. The posture of the learner follows the direction at which

the book is positioned. Furniture should be age appropriate; the desk and chair should be suitable for learner's height. Writing quality is adversely affected if the learner is not seated comfortably. The ideal seating position is for the learner's feet to be flat on the floor, with the knees bent, hips at an angle of ninety degrees and the back supported by the backrest of the chair.

6.4.2. Sub-theme: Writing tools: The participant teachers agreed that tri-grip pencils and tri-grip pencil crayons were most effective in their classrooms, as it greatly assists with pencil grip. The teachers reported that pencils and crayons with smooth, round shafts made it easy for Grade 1 learners to revert to immature pencil grips. Unfortunately, the tri-grip pencils and crayons are not always cost-effective. The teachers seemed to be unanimous on the progression in writing utensils. Although learning in the Reception Year should take place mainly through play, the learners do engage in a limited amount of formal learning. In Grade R, the learners use thick, jumbo wax crayons at the beginning of the year, because at the age of 4-5 years, the young child still uses the whole arm to produce marks on paper. By mid-year, when they are learning to use their fingers and wrists, the Grade R learner will graduate to medium-thick wax crayons and by the end of the year, they use thin wax crayons or roll-up wax crayons, and possibly, pencil crayons. At the beginning of the Grade 1 year, the teachers prefer to revert to medium-thick wax crayons for a short while, before the use of thick pencil crayons for the first term of the school year, and then the normal sized lead pencil and pencil crayons from the second term, which usually starts around April.

6.4.3. Sub-theme: Teacher training: The teacher participants raised concern that not all Grade R teachers in this urban area are sufficiently trained and qualified to teach in the Reception Year. The teachers seem to be aware of some Grade R teachers that have literally attended a two-day course, to fulfil the need for early childhood practitioners. Furthermore, when asked about handwriting instruction the participants have had in their own professional courses, responses varied from "taught briefly", to "received instructions on how to teach handwriting", to "we were trained", which also reflect inconsistency in teacher training at tertiary level. In the 2016 UNESCO report, 50% of pre-primary schoolteachers are qualified and only 80% of primary school teachers are qualified (UNESCO, 2016: 331). Loubser and her colleagues [13] state that early childhood teachers without sufficient training and lacking pedagogical knowledge would be unable to lay a firm foundation for future learning within the young child. These deficiencies, coupled with poor commitment, can prove disastrous in view of the fact that handwriting can be a predictor of future academic success.

7. Conclusion

This research project has confirmed once again that handwriting is an important skill to master at school level. The development of handwriting depend on physical, as well as developmental factors. It is also true that handwriting difficulties can be prevented, or limited, by perceptual training, and therefore a comprehensive pre-handwriting programme at the beginning of Grade 1 can prove beneficial to all learners. The conclusion I have come to is that a pre-handwriting programme, based on the findings of this project, will greatly benefit all learners at the onset of Grade 1. Such a pre-handwriting programme should include daily activities and stipulate the duration thereof in the Foundation Phase classroom.

8. Limitations of the study

The small sample of this study should be taken into consideration when generalising the findings to suburban schools. I did not visit the classrooms personally, as explained. Yet, this could serve as a limitation of the study, as I relied upon data provided by the teachers.

9. Footnotes

This research project was undertaken with ethical approval from NorthWest University, NWU-00202-18-S2

10. References

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