A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature

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Date

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ABSTRACT

The South African Curriculum and Policy Statement (CAPS) document requires a pre-writing programme to be implemented before embarking on formal instruction of handwriting in Grade 1. Yet, an official pre-handwriting programme is not prescribed. Therefore, this study aimed to answer the question of what a South African-relevant pre-handwriting programme looks like that would speak to the handwriting development of Grade 1 learners within an inclusive setting. The researcher set out to compile and implement a pre-handwriting programme according to the needs of six schools in the sub-rural area of Mankweng, Limpopo Province. Factors that influence handwriting include psychomotor skills (such as laterality, directionality, and fine motor skills), affective skills (such as body image) and cognitive skills (such as visual discrimination and midline crossing). Handwriting difficulties is a universal phenomenon, yet handwriting instruction is important even in the digitised era of the 21st century. These factors were addressed in the pre-handwriting programme in an informal way that makes it possible for every learner to succeed. Data were generated by means of questionnaires, classroom observations, focus group discussions, field notes and photographic evidence. The results of this study show that a pre-handwriting programme can fill the void in the CAPS document and that Grade 1 learners in an inclusive setting can benefit from a six-week pre-handwriting programme. This pre-handwriting programme was compiled using inexpensive, everyday materials and fun activities that encourage full participation. Each section of the programme ended with an assessment criterion. These assessments can assist teachers with their decision to either support or refer learners experiencing difficulties in handwriting to occupational therapists (OTs).

Key words: Grade 1; pre-handwriting; handwriting; inclusive practices; CAPS; pencil grip; seating position; letter formation; fine motor skills

OPSOMMING

Die Kurrikulum- en Assesseringsbeleidverklaring (KABV) vereis dat ’n pre-skryfprogram geïmplementeer moet word alvorens formele handskrifonderrig in graad 1 aangepak word. ’n Amptelike pre-handskrifprogram word egter nie voorgeskryf nie. Daarom het dié studie ten doel gehad om die vraag te beantwoord oor hoe ’n pre-handskrifprogram, relevant vir die Suid-Afrikaanse konteks, lyk wat die handskrifontwikkeling van graad 1-leerders binne ’n inklusiewe omgewing sal aanroer. Die navorser het beoog om ’n pre-handskrifprogram saam te stel en te implementeer volgens die behoeftes van ses skole in die sub-landelike gebied van Mankweng, Limpopo-provinsie. Faktore wat handskrif beïnvloed sluit in motoriese vaardighede (byvoorbeeld lateraliteit, rigtingbewustheid en fyn motoriese vaardighede), affektiewe vaardige (byvoorbeeld liggaamsbewustheid) en kognitiewe vaardighede (byvoorbeeld visuele diskriminasie en midlynkruising). Handskrifprobleme is ’n universele verskynsel en tog is handskrif-onderrig steeds belangrik, selfs in die digitale era van die 21st eeu. Hierdie faktore word aangespreek in die pre-handskrifprogram op informele wyse, wat dit moontlik maak vir elke leerder om sukses te ervaar. Data is gegenereer deur middel van vraelyste, leswaarnemings, fokusgroepbesprekings, veldnotas, en digitale foto’s. Die bevindinge van dié studie toon dat ’n pre-skryfprogram wél die leemte in die KABV kan vul en dat graad 1-leerders binne ’n inklusiewe omgewing wél by so ’n program kan baat. Die saamgestelde pre-handskrifprogram bestaan uit bekostigbare, alledaagse gebruiksartikels en lekker aktiwiteite wat volle deelname aanmoedig. ’n Evaluasie-tabel verskyn aan die einde van elke afdeling in die pre-handskrifprogram. Elke afdeling van die program eindig met ’n assesseringskriterium. Hierdie assesserings kan onderwysers help in hul besluit om leerders wat probleme met handskrif ervaar óf te ondersteun óf na arbeidsterapeute te verwys.

Sleutelwoorde: Graad 1; pre-handskrif; handskrif; inklusiewe praktyk; KABV; potloodgreep; sitposisie; lettervorming; fynmotoriese vaardighede

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 INTRODUCTION

The curriculum currently in use in public schools in South Africa is prescribed by the Department of Basic Education (DBE), namely the Curriculum and Assessment Policy Statement (CAPS). CAPS prescribes handwriting as part of Home Language in all 11 official languages. The CAPS document requires that a pre-writing programme be implemented before embarking on the formal instruction of handwriting in Grade 1 “to develop visual discrimination, gross and fine motor and hand-eye coordination, body image, etc.” (DBE, 2011a:19). Though these guidelines state that handwriting should be taught four days per week for 15 minutes per day, an official pre-handwriting programme is not prescribed. The implication of the absence of a pre-handwriting programme is that teachers in the Foundation Phase may teach handwriting skills according to their own understanding and preference.

According to the 2016 Global Education Monitoring (GEM) report, only 50% of pre-primary teachers and 80% of teachers employed in primary schools in sub-Saharan Africa are qualified (UNESCO, 2016:331). Loubser *et al.* (2016:55), Romel *et al.* (2021:4) and Zulfakar (2022:44) further raise the concern that should teachers in early childhood settings be inadequately prepared or lack didactical knowledge, their teaching methods might not be effective in creating an environment that allows for optimal teaching and learning. To compound this situation, Nel and Grosser (2016:83) highlight that South African schools experience a lack of teaching and learning materials, a lack of sufficiently trained and qualified teachers, and a lack of professionally trained personnel to assist with learning challenges. Therefore, the non-existence of a pre-handwriting programme in the CAPS policy can be viewed as one of the areas needing close attention. Teaching handwriting without a prescribed pre-handwriting programme may result in a situation that is detrimental to the optimal development of a vital aspect of children’s education.

Within this environment, teachers are left to teach handwriting at their own discretion and proficiencies. In a study of 177 learners across 23 classrooms, Malpique *et al.* (2017:1804) found that 20% of the difference in learners’ handwriting automaticity could be ascribed to teaching methods and strategies. Peterson *et al.* (2016:17) mention their own Canadian study and cite research studies in early childhood settings – such as Anning (2000) for a

United Kingdom (UK) study, and Hindman and Wasik (2008) for their American (USA) study– to illustrate that teachers' beliefs and practices do not always correspond. Peterson *et al*. (2016:17) claim that teachers' teaching strategies are influenced by a sense of accountability and therefore they tend to teach towards tests and assessments, as opposed to teaching to support the writing of young learners.

Naudé and Meier (2019:9) investigated the learning environment as a possible barrier to effective learning. The setting for their study was a primary school in Gauteng, where 20 out of 117 (17%) Grade 1 learners had failed the grade the previous year. In his ministry's diagnostic overview (The Presidency, 2011:14), Manuel stated that 96% of the country's learners attend public schools. He continued by reporting that although the South African government has embarked on equity funding, challenges in equality still exist in the provision of teaching and learning materials (including desks and chalkboards), infrastructure and equipment. Manuel also mentioned an increase in teachers who have at least a three-year qualification (from 50% to 80%), especially in large African schools. Five years after the publication of Manuel's report, 20% of the 36 000 Grade 1 learners in the Eastern Cape failed the grade (Isaacs *et al.*, 2019:3). A direct link was established between this record failure rate and teachers who were unqualified, underqualified, or qualified but had insufficient pedagogical knowledge (Isaacs *et al*., 2019:3).

Zylstra and Pfeiffer (2016:1) cite several authors (e.g., Feder & Majnemer, 2007; McCarney *et al.*, 2013; Vander Hart *et al.*, 2010) who affirm that even with the advancement of technology, handwriting still is a necessary and essential skill. Malpique *et al*. (2017:1789) echo researchers such as Boyle (2007), Dobbie and Askov (1995), O'Hare (2004), and Pienaar *et al.* (2013) as regards the importance of handwriting as a powerful communication tool, a predictor of academic success and a contributing factor to self-esteem. Rosenburg-Adler and Weintraub (2020:83) report that learners in the early years of primary school benefit more from handwriting than keyboarding, although this changes in the later years of primary school when learners find keyboarding to be more useful in the senior phase of primary schooling. In the same vein, Plebanek and James (2022:5) confirmed the findings by James and Engelhardt (2012:40) who, through whole brain analysis, undeniably established that letter perception and writing letters and taking notes by hand activate more reading systems in the brain and stimulate more brain networks that are used in reading and writing than typing on a keyboard. This was clear in the more effective recall of letters that learners had handwritten compared to letters that they had typed (Plebanek & James,

2022:3).

In conclusion, the legacy of our past and current schooling systems has left many unequal aspects. However, whatever the past yielded and the present brings, the need to develop programmes to transform and address issues in our system is imperative, as inclusive practices are mandatory. This is the reason for engaging in research to establish a mandatory pre-handwriting programme.

1.2 BACKGROUND ON WRITING SUPPORT IN SCHOOLS

1.2.1 Writing support in schools – the international context

In the USA, up to as recent as the 1990s, learners were referred to occupational therapists (OTs) when they presented with fine motor difficulties (Case-Smith, 1996:52). McHale and Cermak (1992:898) observed elementary classrooms to verify the amount of time dedicated to activities that require fine motor- and handwriting activities in a school day. The finding was that 30–60% of a school day was consumed by activities that required fine motor skills, and these were mainly handwriting tasks. With a possible two-thirds of classroom time involving fine motor skills, especially handwriting, it can be deduced that difficulties with fine motor tasks could have an unquestionable impact on learners (McHale & Cermak, 1992:898). In a similar study by McMaster and Roberts (2016:45), it was found that handwriting amounts to 84% of the fine motor activities that learners engage with in the classroom, which is in line with the findings of McHale and Cermak.

Case-Smith (1996:54) pioneered the initiative to invite OTs into the classroom to assist learners who are struggling with fine motor skills. It was reported that the supported learners had made “significant progress” by the close of the school year and “slightly improved in functional performance” after one intervention session per week (Case-Smith, 1996:54). As learners show improved fine motor skills because of OT interventions, teachers become more aware of learners’ needs and, in turn, teachers have become more pre-emptive in taking an OT approach (Reid *et al.*, 2006:221). This finding by Reid *et al.* (2006:221) is emphasised by O’Donoghue *et al.* (2021:2), namely that learners benefit from a collaborative approach between OTs and teachers.

Although the international trend in OT has been for OTs to go into schools and support learners by removing them from the classroom for consultation, it seems that school-based

occupational therapy (SBOT) is beginning to move away from the pull-out model and OTs now provide support in the classroom. On the recommendation of the World Federation of Occupational Therapy (WFOT), this is based on evidence of marked progress by learners who have experienced support in the natural setting where education is taking place (O'Donoghue *et al*., 2021:2). Also, in the UK, the call has gone out for the pull-out model to be replaced by a more inclusive model (Rivera & Boyle, 2020:266). In India, school-based OTs are an integral part of the school community and learners are referred for comprehensive OT support for everyday performance in the classroom (Ahirwal *et al.*, 2021:104).

Echsel *et al.* (2019:6) found that while OTs in the USA, Australia, New Zealand, and Canada form part of the school community and aim for full inclusion inside and outside of the classroom, Switzerland is beginning to make great strides towards full inclusion as well. Jansen van Vuuren *et al.* (2020:5, 8) acknowledge that the need for OTs has been identified in African communities and underscore the shortage of qualified OTs, geographical challenges because a large percentage of the population live in widespread rural areas, and the wretched lack of funding and resources. South Africa has adopted the practice of a compulsory year of community service as an addition to the professional qualification of OTs to fill the OT needs of communities (Jansen van Vuuren *et al*., 2020:5). As findings from a study in Pakistan with children at the age of 2 and again at the age of 4 have shown, it might be imperative for children to be cognitively and physically stimulated at pre-school age for optimal development of fine motor skills (Armstrong-Carter *et al.*, 2021:893). This follows on Michel *et al.*'s (2020:368) findings that should motor coordination skills not be sufficiently developed, mastery of handwriting may be hampered. Parents and communities should be made aware of this, and OTs in South Africa can use the compulsory year of community service to raise awareness in this regard.

In stark contrast to Western countries, SBOT does not feature on the list of the OT in the African context. This is evident when Jansen van Vuuren *et al.* (2020:6) list the context of OT operations in the African context as bringing understanding of disabilities to communities in South Africa, Tanzania, and Kenya; campaigning for policies on inclusion in Rwanda; assisting families with disabled children in Kenya; rehabilitation and societal inclusion of people with mental health conditions in Zimbabwe; and advocating for girls as victims of sexual abuse in wartime in Uganda. Therefore, little to no knowledge of how children learn to write is instilled in African schools via OTs, and the amount of support to struggling

handwriters is an open question.

According to Cramm and Egan (2015:175), OTs have highlighted the necessity for teachers to develop a deeper understanding of the development of handwriting in learners. They reason that once teachers are conversant with the process of learning to write, they should be able to support young learners in the development of this fine skill. This, however, still leaves teachers with the handwriting system prescribed by school management. Two internationally known handwriting programmes – i.e., *Magic Link Handwriting Programme*[1] and *Handwriting Without Tears*[2] – are often recommended by home-schooling parents or by practitioners. Another programme, the *Write Start* handwriting programme, was developed as intervention instruction to promote writing fluency and improve legibility. This programme bears testimony to the benefits of collaboration between teachers and OTs (Persch *et al.*, 2014:650). *Handwriting Without Tears* is a support programme aimed at parents to support their children experiencing handwriting difficulties, with continued assistance from their teachers (Patton & Hutton, 2016:273). The *Handwriting Without Tears* programme was expanded to the *Handwriting Without Tears – Get Set for School* (HWT-GSS) programme. The HWT-GSS programme uses play-based sensory learning to develop the necessary pre-handwriting skills (Lust & Donica, 2011:561). The handwriting programmes mentioned here are freely available on the Internet, with materials and books[3] that can be bought[4] and downloaded[5].

1.2.2 Writing support in schools – the South African context

According to the South African Screening, Identification, Assessment and Support Policy (SIAS) (DBE, 2014:1), and consistent with Education White Paper 6 (DoE, 2001), teachers are obliged to support learners when difficulties are identified before referring them for further professional assistance (DBE, 2014:24). However, in the South African context, two

[1] www.magiclinkhandwriting.com

[2] https://www.lwtears.com/hwt/details

[3] https://www.wantitall.co.za/brands/handwriting-without-tears/all/p1

[4] https://www.zaner-bloser.com/handwriting/zaner-bloser-handwriting/index.php

[5] http://loopsandtails.com/spencerian/

factors are at times evident that compound the challenges Grade 1 learners face when they are entering the schooling system and are required to fulfil Grade 1 requirements. Firstly, many children enter formal schooling without having attended a reception year. The reception year (known as Grade R or Grade 0) would have exposed the learner to perceptual and motor learning (Richter & Samuels, 2017:15). Exposure to perceptual-motor development leads to better coordination, better body awareness, and even an improved self-image – all of which are needed for academic achievement (Excell & Linington, 2015:59; Pienaar *et al.,* 2013:370). Richter and Samuels (2017:16) report evidence of learners who have attended the Grade R year of schooling displaying better writing skills compared those who have not attended Grade R. It is reported that developmental coordination difficulties are estimated in 5–6% and 4–13% of learners between the ages of five and 11 years, with boys showing a higher prevalence of coordination difficulties than girls (Amador-Ruiz *et al.*, 2018:539). With these figures in mind, and with the possibility of learners not attending Grade R, developmental coordination difficulties might manifest in Grade 1 as fine motor difficulties during the acquisition of formal handwriting skills. Secondly, according to the admission policy of the South African DoE (2007), a learner may enter Grade 1 at age 5, turning 6 before 30 June of the same year, or at age 6, turning 7 in the same year. This age discrepancy and variation result in classes where learners have age differences of up to two years in one class (Loubser *et al.,* 2016:55). Therefore, by June of a learner's first school year, up to 33% of Grade 1 learners reportedly present with poor academic performance, which can be attributed to a correlation between visual-motor integration (VMI), socio-economic status, and proficiency in reading, writing and mathematics (Pienaar *et al*., 2013:74).

In considering the above-mentioned two factors, Pienaar *et al*. (2013:376) reported that VMI, visual perception (VP) and kinaesthetic awareness have been confirmed as imperative to achievement in mathematics, reading and concentration. Therefore, without the exposure to a compulsory perceptual-motor programme and the variety of ages in Grade 1, an important foundation is absent, leading to many difficulties and challenges experienced by Grade 1 learners. Excell and Linington (2015:59) caution that perceptual-motor behaviours are usually fully developed by age 7. Thus, a standardised pre-handwriting programme in the Grade 1 classroom is believed to be essential for the young learner who has not been exposed to a reception-year perceptual-motor programme and who might find it difficult to acquire the basic handwriting skills.

Therefore, the researcher argues that in view of the South African educational system, the importance of the DBE defining and providing a pre-handwriting programme to Foundation Phase teachers should be considered a prerequisite. Guidelines contained in a pre-handwriting programme would provide a structure within which experienced as well as new teachers can be directed in the development of handwriting and perceptual development. Previously, the curriculum has failed to provide for the diverse needs of learners (Naicker, 2000:2). The diverse needs of learners are addressed with the sanctioning of inclusive education, as set out in White Paper 6 (DoE, 2001), which guides the implementation, adoption and establishment of inclusive education in South Africa. Provision is made for further needs that learners may experience, guided by the SIAS document (2014). Naicker's (2000:2) statements were aimed at inclusive schooling and tie in with the motivation for a pre-handwriting programme, as it would narrow the gap in inclusive practices. Inclusive practices, such as a pre-handwriting programme, may benefit all learners – whether refining fine motor skills or developing fine motor skills – for learners to attain handwriting readiness. Difficulties with handwriting accounts for the largest number of referrals to OTs (Donica *et al.*, 2013:82). Learners are most often referred for OT when experiencing handwriting difficulties because the frustration experienced with struggling to master the fine motor and cognitive skills necessary for handwriting may have an adverse effect on learners' concentration, motivation and attitude towards schoolwork (Donica *et al*., 2013:81).

1.3 AIM AND OBJECTIVES OF THE STUDY

1.3.1 Main aim

Creswell and Creswell (2020:118) suggest the use of a single phenomenon as the aim and objective of a study in order to have a clear, identifiable focus in the study. The aim of this study was to fill the void left by the CAPS document that does not prescribe a pre-handwriting programme, although the use of such a programme is recommended (DBE, 2011a:19). Furthermore, the aim of compiling a pre-handwriting programme was to lessen or to eliminate possible perceptual difficulties that could possibly have caused barriers to learning in young learners. The objective of this study was to compile a pre-handwriting programme that could become a standard document to use in Grade 1 classrooms, enabling all Grade 1 teachers to successfully orientate Grade 1 learners for formal handwriting instruction.

1.3.2 Objectives of this study

To achieve the aim of this study, the following objectives were set:

- to employ a six-step curriculum development approach, as recommended by Thomas *et al.* (2016:7), to assess the need for, goals, objectives and outcomes of a pre-handwriting programme;
- to compile a pre-handwriting programme;
- to implement the compiled programme in 16 Grade 1 classrooms in a sub-rural area in Limpopo province over a period of six weeks;
- to get teachers' feedback on the pre-handwriting programme at the end of the six-week period, and to refine the pre-handwriting programme based on the feedback.

1.4 PURPOSE OF THE STUDY

The purpose of this study was to fill the identified void in the CAPS curriculum by compiling a pre-handwriting programme that will benefit learners in terms of inclusivity, using resources that are easily obtainable, if not everyday objects, to ensure accessibility for all Grade 1 learners and primary schools. An added advantage of such a standardised pre-handwriting programme will be the standardised assessment of learners against age-appropriate standards. The teacher will be empowered by being able to decide, in the best interest of the learner, to either support or refer a learner experiencing difficulties with fine motor skills to an OT or to other support professionals. The implication is that a prescribed pre-handwriting programme will level the playing field for all learners and provide quality education for all.

1.5 RESEARCH QUESTION

The findings of the researcher's master's studies (Annandale, 2019) were based on the experiences of Grade 1 teachers in respect of difficulties experienced by Grade 1 learners in handwriting. The following themes and sub-themes emerged as challenges (table 1.1).

Table 1.1: A summary of the findings by Annandale (2019:42)

Theme 1: Fine Motor Skills	*Sub-themes:* Pencil grip and letter formation
Theme 2: Visual Memory	*Sub-themes:* 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

Therefore, based on this prior research, the following research question asked was:

What should a South African-relevant pre-handwriting programme look like that will speak to the handwriting development of Grade 1 learners within an inclusive setting?

1.5.1 Secondary research questions

- To what extent can the elements identified by Annandale (2019:54-64), as shown in Table 1.1 be accommodated in the compilation of such a programme?
- To what extent can fine motor skills (including pencil grip and letter formation), visual memory (including direction, space, and reversals), intrinsic physical aspects (including low muscle tone and midline crossing) and extrinsic environmental aspects (including seating position and writing tools) form the basis of a pre-handwriting programme that will assist in the optimal development of Grade 1 learners in an inclusive setting?
- Is it possible to compile a comprehensive pre-handwriting programme with resources that are everyday objects, or easily obtainable, in a sub-rural area?
- Will Grade 1 teachers experience a uniform set of assessments as helpful in the decision to either support or refer the learner for occupational therapy?

1.5.2 Background to the study

During the researcher's MEd study, she sounded out the Grade 1 teachers on a prescribed pre-handwriting programme, and they welcomed the idea. It was found that the teachers

needed clear and concise guidelines in the teaching of handwriting (Annandale, 2019:68). The teachers seemed to need a document or guidelines they could trust, rely on and refer to that would make their daily planning easier. To the researcher's surprise, the teachers presented with an overwhelmingly positive response, as opposed to the expected apprehension about yet another document to add to their classroom activities. Their response inspired the researcher to undertake the collaborative effort of a pre-handwriting programme. The findings of the researcher's Masters study, as shown in Table 1.1, have been integrated in this study, as the outcomes of the Master's study provided valuable information for the compilation of a pre-handwriting programme.

1.6 CONCEPTUAL AND THEORETICAL FRAMEWORK FOR THE STUDY

1.6.1 Conceptual framework for the study

Maree (2019:35) recommends that a conceptual framework describes events related to one's study and links key concepts throughout the study. The CAPS document states that before teaching handwriting formally to Grade 1 learners, a pre-writing programme should be employed "to develop visual discrimination, gross and fine motor and hand-eye coordination, body image, etc." (DBE, 2011a:19). The following concepts were therefore crucial to this study and can be understood as follows:

1.6.1.1 Grade 1

The South African Schools Act of 1996 states that it is mandatory for South African children to attend school from the age of 6. It is compulsory for a learner to attend school from the year in which they turn 6.[6]

1.6.1.2 Learners

Mlachila and Moeletsi (2019:4) refer to a learner as a child enrolled in primary school; therefore, Grade 1 learners are the learners who enter their first formal school year. The learners in a classroom are described as the persons guided by the teacher to take

[6] https://www.brandsouthafrica.com/governance/services/education-services/a-parents-guide-to-schooling

responsibility for their own learning (Aubrey-Smith, 2017).

1.6.1.3 Teacher

Parkes (2013:114) describes teachers as curriculum workers responsible for quality learning outcomes in the nation's children. The South African Council for Educators (SACE) views teachers as those endowed with providing learners with knowledge in a safe environment (socially and psychologically), and teachers are seen as role models to learners (SACE, 2020:2).

1.6.1.4 The Grade 1 teacher as part of the Foundation Phase

The Minimum Requirements for Teacher Education Qualifications compels a Foundation Phase teacher (which includes Grade 1 teachers) to be capable, qualified instructors of Home Language, First Additional Language, Mathematics, and Life Skills in Grades 1 to 3. In addition, a Foundation Phase teacher must be competent to identify and address any barriers to learning learners might experience (National Qualifications Framework Act, 2015:2). The duties of a Foundation Phase teacher are described as providing direct, concrete activities to support young learners in their holistic development and assessing learners with the aim of supporting them (DoE, 1997:34).

1.6.1.5 Experienced teachers

Gatbonton (2008:162) defines experienced teachers as teachers who are more consistent in terms of the application of their pedagogical knowledge because they have already spent at least three years in the classroom and have dealt with repeated educational situations to the extent that they are able to remember which teaching strategies are more effective than others in a given situation. The online Oxford dictionary defines experience as "the knowledge or skill acquired by a period of practical experience of something, especially that gained in a particular profession".[7]

1.6.1.6 New teachers

"New teachers" refers to newly qualified teachers as well as teachers who are new to the

[7] https://en.oxforddictionaries.com/definition/experience

teaching profession. Roster (2019:7) describes new teachers as qualified persons who have been teaching for less than three years. Zimmerman (2019:9) explored the challenges and emotions experienced by newly qualified teachers, as they had been equipped with the pedagogical knowledge but still had to form their own teaching identity. Once newly qualified teachers embark on a teaching career, they must grow professionally, yet satisfy their own expectations as well as those of parents (Zimmerman, 2019:10). It is a fine balancing act while a new teacher grapples with feelings of frustration, disillusionment, fear, and self-doubt (Zimmerman, 2019:16).

1.6.1.7 Pre-handwriting skills

For this study, pre-handwriting skills were considered to be midline crossing, letter recognition, established hand dominance, pencil grip, eye–hand coordination, and posture (Banumathe *et al.*, 2016:20; Pienaar *et al*., 2013:736; Feder & Majnemer, 2007:313). Pre-handwriting skills develop as the young learner progresses from drawing straight, vertical lines to more challenging lines, including curved lines, zigzag lines and diagonal lines (Loubser & Hoogbaard, 2014:3). The following pre-handwriting skills have been identified in the literature as crucial to proper handwriting instruction:

1.6.1.7.1 Postural stability

Postural stability is defined as muscle power to maintain a postural position while using the arms (Flatters *et al.*, 2014:2908). Postural stability enables a learner to maintain body control while standing, walking, or sitting (Excell & Linington, 2015:61). Castellucci *et al.* (2021:2) further describe postural stability as the relationship between the lumbar spine, trunk, pelvis, hips and knees, and related to the seat and desk of a learner as a dynamic seating position.

1.6.1.7.2 Fine motor skills

The small muscles in the hands are used to manipulate small objects in tasks such as folding paper, cutting, pasting, and operating a computer (Dinehart, 2015:99; McHale & Cermak, 1992:10). Pitchford *et al.* (2016) posit that fine motor skills and visual attention strengthen the basic connection between the motor and cognitive domains.

1.6.1.7.3 Pencil grip

The way in which a learner holds and uses a writing utensil is called the pencil grip or pencil

grasp (Schwellnus *et al.*, 2012:719). Odokuma and Ojigho (2019:121) describe pencil grip as the placement of the fingers on a pencil and further assert that pencil grips are named according to the patterns of finger placements on a pencil. Examples of this are the palmer supinate grip and the digital pronate grip (Odokuma & Ojigho, 2019:124).

1.6.1.7.4 Kinaesthesia

Wolf *et al.* (2017:301) explain kinaesthesia as the sense of touch when learners trace over letters using their index finger. Thus, learners "feel" the shape and formation of a letter.

1.6.1.7.5 Visual motor integration

Coetzee and Gerber (2018:48) state that learners' cognitive functions and intelligence coefficients are associated with visual motor integration (VMI) and visual perception skills. Visual perception (sensory information) and motor coordination (movement) are integrated cognitive functions used in tasks such as copying, writing from the board, and drawing (Africa & Van Deventer, 2017:1961; McHale & Cermak, 1992:10; Pienaar *et al.*, 2013:372).

1.6.1.8 Pre-handwriting programme development

By incorporating the elements outlined in table 1.1 into a pre-handwriting programme, the Grade 1 teacher should be equipped with a tool in terms of planned activities that, with diligent implementation, would lead to the development of pre-handwriting skills in order to prepare learners for the successful acquisition of handwriting. Thomas *et al.* (2016:1) describe a programme as "a planned educational experience". For the purpose of this study, the pre-handwriting programme can be described as a sequence of educational experiences over a period of six weeks.

1.6.1.9 Inclusive practices

Maapola-Thobejane and Maguvhe (2021:12) describe the disregard for the diverse needs of learners as "totally unacceptable". These authors assert that it should be the serious undertaking of each teacher to ensure that every learner achieves success and has the means necessary to achieve success.

Four considerations taken from a discussion by Nutbrown *et al.* (2013:120) were deemed important in this study in the spirit of inclusion, namely adult involvement, assessment, and

learners' rights. Firstly, Sefoto (as cited in Maguvhe, 2021:27) underscores adult involvement in learners' learning. Although the latter includes parents, in the case of this study, adults were Grade 1 teachers only because the pre-handwriting programme was implemented in the classroom and did not form part of homework tasks. Secondly, regarding assessment, Koen (as cited in Naudé & Davin, 2017:137) advocates for assessment through observation in the early grades. Similarly, the pre-handwriting programme had to enable Grade 1 teachers to assess the performance of each learner against the typical developmental level of each learner. Learners were assessed and assisted, if needed. The third consideration involved learners' rights, and according to the Constitution of South Africa, the right to education (1996:13). For learners who had not attended the reception year before Grade 1, the pre-handwriting programme could have provided exposure to perceptual activities. It may also have provided additional opportunities for learners who had indeed attended the reception year but perhaps needed more exposure. The fourth consideration was play-based learning. Danniels and Pyle (2022:5) laud the importance of play-based learning in discovering the strengths of learners and recognising social inclusion. The envisioned aim of the pre-handwriting programme was that it would include all learners in an informal, playful manner, with activities that are short yet effective and that invite and encourage participation by all learners. The pre-handwriting programme had to be accessible to all learners in the classroom to be considered inclusive. All learners had to be able to achieve success, regardless of possible varying developmental levels within the group of Grade 1 learners.

1.6.1.10 Sub-rural area

A sub-rural area is a township area. In this study, the Mankweng area, also known as Sovenga township, was selected as the research site. Using the classification reported by Medani (2016), the township (or sub-rural area) is classified as follows:

- Population size: Mankweng has between 5 000 and 20 000 inhabitants but does not have its own municipality.
- Water supply: Portable water systems and communal taps are used. Most schools and houses do not have running water.[8]

[8] https://www.ufs.ac.za/docs/librariesprovider23/default-document-library/polokwane.pdf?sfvrsn=0

- Electricity: Some schools and homes have electricity, but a vast number of homes do not have electricity.[9]
- Municipal health services: Mankweng Hospital serves as a tertiary referral hospital (Nchabeleng *et al.*, 2022:1).

Excell *et al.* (2015:7) paint the picture of villages and rural communities as not always being easily accessible and not having adequate physical environmental conditions in schools or communities, resulting in the learners' academic performances often being poorer.

1.6.2 Theoretical framework for the study

Jansen (2019:16) explains that a research study should be grounded in a sound theoretical framework, as this would keep the research focused on the topic. This study was looked at through the lens of activity theory (AT). Hashim and Jones (2007:1) explain that AT is based on activity being primary, in other words, activity comes before intellectual thought, goals and intentions; it "grows out of people doing things" (Hashim & Jones, 2007:1; Morf & Weber, 2000:81). Hashim and Jones (2007:2) further explain that AT comprises "subject, tool and object".

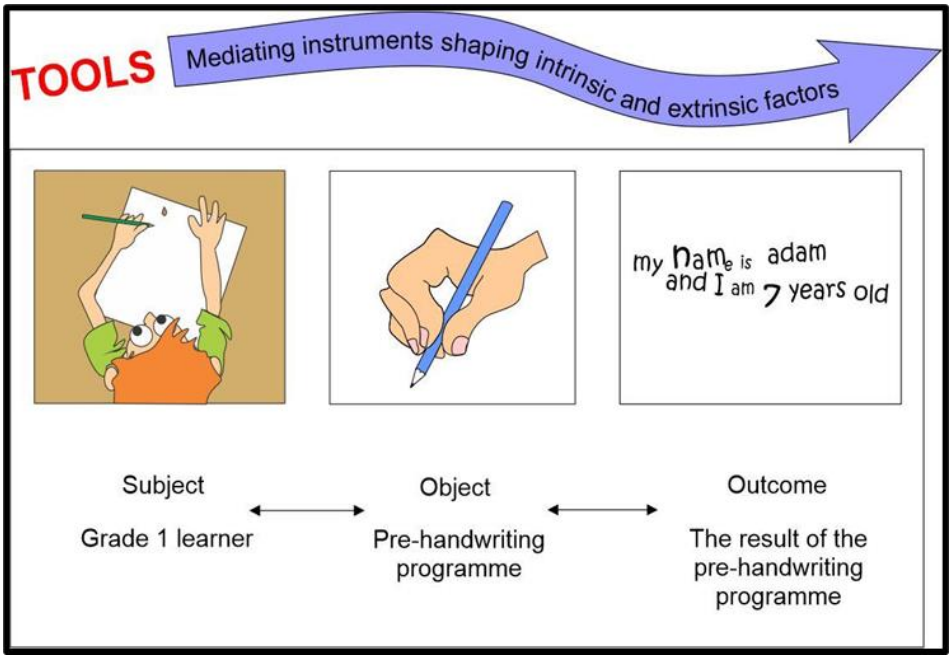


Figure 1.1: Activity theory employed in this study

[9] https://www.ufs.ac.za/docs/librariesprovider23/default-document-library/polokwane.pdf?sfvrsn=0

Thus, applying AT to this study, the subject in this study was the Grade 1 learner, because they were studied; the object was the compiled pre-handwriting programme (the intended activity); and the tools were the mediating device by which the actions were performed, as illustrated in figure 1.1. Tools as mediating instruments permit appropriate and socially developed forms of “acting” (Ding, 2021), or in this study, the activity in which the learners engaged. Mediation by tools refers to technical tools that work on objects, or psychological tools that mediate the mind and environment (Ding, 2021). Thus, the tools referred to in this study could be the Grade 1 teachers, as the facilitators of the pre-handwriting programme, the experiences of the participants, knowledge or anything that shaped the external behaviour or internal mental functioning of individuals (Ding, 2021).

As suggested by Hashim and Jones (2007:2), in this study, the researcher also employed AT as a personal activity system to conduct the study. As this study was approached as an activity system, a complete six-step approach (§ 1.6.2) was used as a framework to obtain and analyse data on a Grade 1 pre-handwriting programme that promoted inclusive practices in the classroom. Therefore, the focus of this study was to explore the compilation of a pre-handwriting programme through the six-step approach in curriculum development, according to the guidelines provided by Thomas *et al.* (2016:7), based on the theory of activity in human interactions. The pre-handwriting programme had to speak to the diverse needs of learners and address the inclusive practice of pre-handwriting instruction in a South African context. In this sense, AT was used, as illustrated in figure 1.2, with teachers as the subject, the six-step approach as the tool, and the pre-handwriting programme as the object.

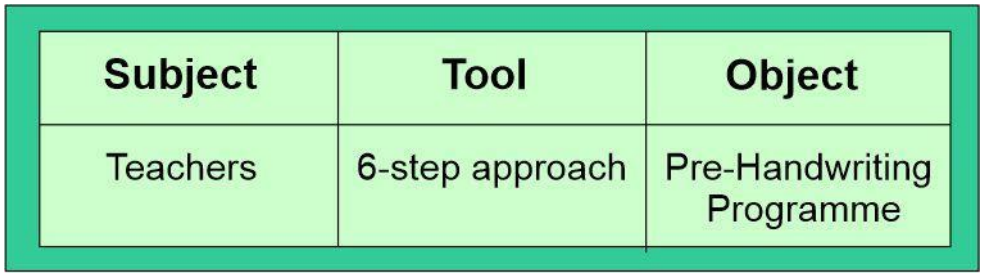


Figure 1.2: Six-step approach in curriculum development seen through the lens of the AT

The six-step approach in curriculum development (Thomas *et al.*, 2016:7) was used as a guide to compile a pre-handwriting programme. Although this approach was developed for

medical instruction, it can be applied successfully to inclusive education, as explained in § 1.6.2.1 to 1.6.2.6. The authors underline that this approach is an interactive process, and progress may be made in one or more steps concurrently. In addition, a curriculum evolves continuously, as resources, evaluation results, targeted learners and content material change all the time (Kern, 2016:8). Thus, this six-step approach in curriculum development (Thomas *et al.*, 2016:7) was the initial starting point in this study to obtain the necessary information to proceed with the development of a pre-handwriting programme. An overview of this process now follows.

1.6.2.1 Step 1: Problem identification and general needs assessment

This first step towards a curriculum or development of a programme within a curriculum is identifying the problem (Kern, 2016:6). This could be a particular problem that leads to a group of problems or a few problem areas that need to be investigated. In this study, the identified problem was the void left in the CAPS document by the lack of a prescribed pre-handwriting programme. From this problem, the need for a prescribed programme with uniform assessment criteria was identified.

The researcher made use of questionnaires (see Annexure J) to conduct a general needs assessment. Very few schools in the sub-rural area of Mankweng had access to the internet at the time of this study. Most often, the contact number and e-mail address used for the school belonged to the school principal. Therefore, questionnaires could not be e-mailed to the schools. Questionnaires were delivered by hand and collected a few days later. The questionnaires were expected to provide some initial insight into the circumstances at the schools, the teachers' view on handwriting and how handwriting was taught at the time at Grade 1 level in Mankweng.

1.6.2.2 Step 2: Targeted needs assessment

In this step, the needs of the target group (i.e., Grade 1 teachers and learners) and their learning environment were assessed. This step may include the integration of a specific curriculum (the pre-handwriting programme) into the existing curriculum (CAPS) (Kern, 2016:6). The pre-handwriting programme intended to complement the current curriculum, by no means replacing any element in the currently prescribed CAPS document. Observing the participating teachers and learners in the classroom were insightful as regards the presentation of handwriting lessons and the measure of success in handwriting achieved by

the Grade 1 learners. The success of intervention strategies for handwriting employed by teachers thus far should have been evident in the learners' workbooks in the form of finely coordinated fine motor skills. An observation checklist (see Annexure K) enabled the researcher to observe the same components at all the schools. The researcher planned to conduct open-ended discussions with the teachers on the day she visited their classrooms to observe the handwriting lesson. Open-ended discussions allowed the researcher to explore the participants' views, beliefs and attitudes in a conversational manner (Nieuwenhuis, 2019:108). Apart from gaining insight into the teachers' views on handwriting instruction and support to learners experiencing handwriting difficulties, the researcher also hoped that by communicating with the teachers conversationally, she could develop a relationship of trust, make the teachers feel part of this project, ensure they would consent to implementing the pre-handwriting programme once it had been compiled, and encourage the teachers to participate in the focus group discussion following the implementation of the pre-handwriting programme. Field notes were taken while observing the classroom proceedings. Field notes and personal communication made it possible to establish accurately what resources were readily available at schools in the sub-rural area of Mankweng, and this was taken into account with the compilation of the pre-handwriting programme.

1.6.2.3 Step 3: Goals and objectives

The goals and objectives of this study were crucial to the development of curricular content, as they determined the content to be included in the curriculum and the reason for the inclusion of certain material over other material. Kern (2016:7) explains that objectives may include cognitive objectives (knowledge outcome objectives), affective objectives (attitudinal outcome objectives), or psychomotor objectives (skill and behavioural outcome objectives). The questionnaires, field notes, and checklists were compared and analysed. These documents were expected to provide an educated estimate of the span of handwriting difficulties experienced by learners, resources available, teaching strategies and interventions employed across the schools in the sub-rural area of Mankweng.

1.6.2.4 Step 4: Educational strategies

Once the objectives had been refined, the curriculum content could be selected and,

subsequently, educational strategies could be explored that would speak to the realisation of the objectives set (Kern, 2016:7). In step 4, the researcher considered the data from the challenges that were identified by Grade 1 teachers in a master's study (Annandale, 2019:42) alongside the data gathered on the challenges identified in this study from the discussions with and questionnaires completed by Grade 1 teachers from the Mankweng area.

Thus, one of the research tasks foreseen in this study was to identify and explore the instructional methods best suited to the teachers, learners and the learning environment in the sub-rural area of Mankweng according to time, space and resources available to them. The accumulated information was drawn on to compile the pre-handwriting programme.

1.6.2.5 Step 5: Implementation

In this step, both the implementation of the new curriculum and its evaluation took place. Kern (2016:8) explains the components attached to this step:

- procuring ethical endorsement;
- determining and acquiring resources;
- recognising and solving possible difficulties in the implementation;
- introducing the curriculum to or piloting it on an approachable audience;
- refining the curriculum.

This step represented the largest portion of this study, as the compiled pre-handwriting programme was implemented in 16 Grade 1 classes in the sub-rural area of Mankweng, a district in the Capricorn Circuit. The researcher and gatekeeper visited the six participating schools beforehand to explain the purpose of the programme, demonstrate the activities and answer any questions the Grade 1 teachers might have had.

1.6.2.6 Step 6: Evaluation and feedback

To achieve sufficient evaluation and to obtain feedback, the pre-handwriting programme was evaluated during the ensuing focus group discussions with the teachers. These focus group discussions with the Grade 1 teachers were the last step in the study and added to the refinement of the pre-handwriting programme. The effectiveness of all the components of the programme was assessed, such as the content, the duration of the activities, the level of ease in implementation, the assessment criteria, as well as the need for and availability

of resources.

1.7 RESEARCH PARADIGM, DESIGN AND METHODOLOGY

Constructivism is described as a process wherein participants are actively involved in all phases of the process, in their own lives or as part of a research study (De Vos *et al.*, 2013:7). Constructivism acknowledges that the common aim of research participants is to understand the realm in which they live and work (Creswell & Creswell, 2018:8; Merriam & Tisdell, 2016:6). In this study, the constructivist approach was optimally utilised, as this study was undertaken in learner-centred classrooms (Gunduz & Hursen, 2015:527). Grade 1 learners were observed in their own natural surroundings in an attempt to understand the world of the young learner acquiring pre-handwriting skills.

Qualitative research occurs in the natural setting of the participants and depends on words rather than on statistics and numerical data (De Vos *et al.*, 2013:308). Qualitative research aims to understand rather than explain, as researchers want to understand how individuals make sense of the world and relate to those around them (De Vos *et al.*, 2013:308; Nieuwenhuis, 2019:119). Therefore, for this study, a qualitative research design was applied as research method, because qualitative research methods permitted the quintessence of this study, making it the most appropriate path to follow in order to answer the research question.

The methodology used was the initial six-step approach in curriculum development (Thomas *et al*., 2016:7), which comprised of questionnaires, classroom observations, the taking of field notes, focus group discussions, and digital evidence of learners' work.

1.8 RESEARCH PARTICIPANTS

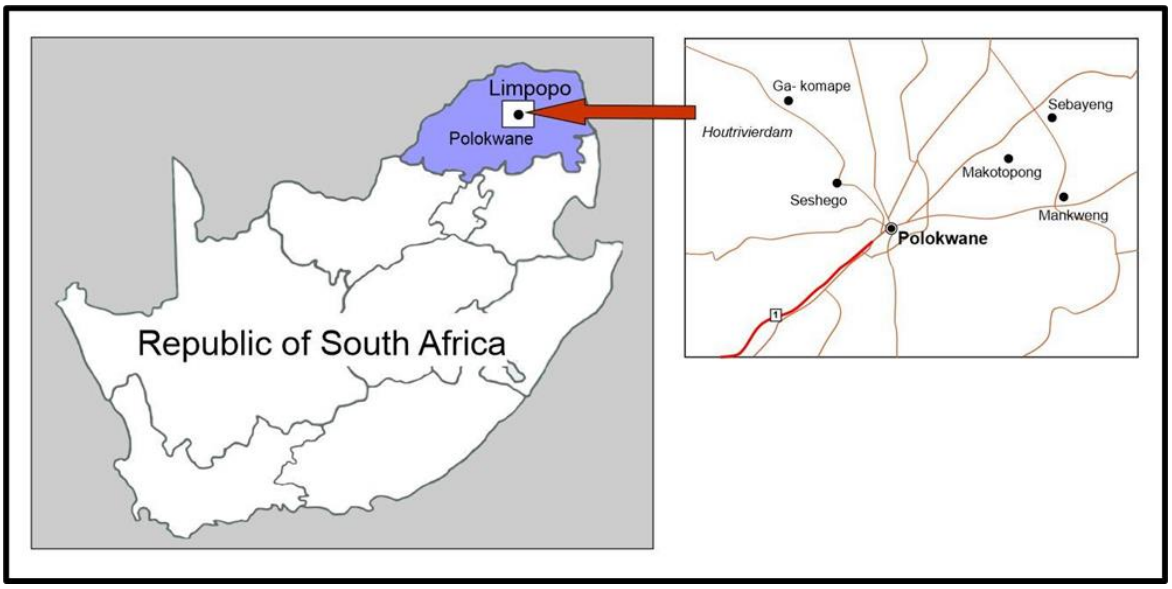
1.8.1 Sample selection

A sample is a representative sub-section of the populace that is studied and attained in an effort to understand the greater populace of which it forms part (De Vos *et al*., 2013:223). Purposive sampling was employed in this study (De Vos *et al*., 2013:232). This sampling was solely at the discretion of the researcher, as the sample had to contain certain distinctive elements of the studied populace that had to speak to the posed research questions. Therefore, 16 Grade 1 teachers were invited from six schools in the sub-rural area of Mankweng, Limpopo province, to be part of this research study. Grade 1 classrooms in

Mankweng were selected for the purpose of this study because, although sub-rural Mankweng is closely situated to the capital city of the province, Polokwane, accessibility to OT services is not guaranteed. Furthermore, in line with inclusive education, the SIAS document (DBE, 2014:12) tasks teachers to address barriers to learning and development, which includes socio-economic aspects, factors that place learners at risk, negative attitudes, inflexible curriculum implementation at schools, and inadequate provision of support services.

1.8.2 Site selection

This study was conducted in Mankweng, a sub-rural area approximately 30 km north of Polokwane, in the Capricorn Circuit. Mankweng District was the area of choice because of its close proximity to Polokwane. Map 1 indicates Limpopo province, with Polokwane as the capital city of the province, as well as the geographic location of the sub-rural area of Mankweng situated outside Polokwane. Mankweng is expanding and developing rapidly, with housing developments equalling industrial development in line with the Polokwane Integrated Development Plan 2021-2026 (Polokwane n.d.) However, even with this development taking place, limited cell phone reception as well as limited internet access compound the problem of access to advice should a learner experience challenges in the acquisition of handwriting or perceptual difficulties.



Map of South Africa, showing the Limpopo Province, with Polokwane as the provincial capital, and the location of the sub-rural area of Mankweng in relation to Polokwane. (Adapted from https://southafrica-info.com/land/nine-provinces-south-africa/ and https://www.viamichelin.ie/web/Maps/Map-Mankweng-0727-Limpopo-South_Africa)

1.8.3 Inclusion criteria

The participants in this study were 16 Grade 1 teachers from six sub-rural schools, who were willing to participate in the implementation of a pre-handwriting programme. These teachers consented to focus group discussions and to be audio-recorded.

1.8.4 Exclusion criteria

All Foundation Phase teachers who were not Grade 1 teachers or who were teachers who were not in a position to teach Grade 1 learners at the time of the study were excluded from the research.

1.9 DATA GENERATION

After the gatekeeper had established contact with the schools, the process of data generation followed, guided by the sequence of steps in the six-step approach in curriculum development (Thomas *et al.*, 2016:7). Open-ended data sources (Creswell & Creswell, 2018:181) – in the form of questionnaires, classroom observations, focus group discussions, field notes and photographic evidence – were used in this qualitative study.

1.9.1 Questionnaires

The first step in data generation was to hand out questionnaires (see Annexure J) to the Grade 1 teachers. The rationale behind the questionnaires was to determine the teachers' level of teaching experience. The questionnaires provided an opportunity for the teachers to express their views on handwriting and the teaching of handwriting. The questionnaires also provided insight into the resources available for the teaching and learning of handwriting in the schools in the sub-rural area of Mankweng.

1.9.2 Classroom observations

Creswell and Creswell (2018:186) describe observations as an opportunity for the researcher to take field notes on the activities observed. The researcher visited each Grade 1 classroom by appointment and observed the presentation of one handwriting lesson. After the lesson, photographic evidence was collected of written work in learners' workbooks as well as pencil grips employed by the learners (see photograph 4.1). Care was taken to photograph only the learners' hands for pencil grip in the presence of and witnessed by the

teacher.

1.9.3 Field notes

During the classroom observations, the researcher took field notes as part of qualitative observation, as described by Creswell and Creswell (2018:186). Teachers' letter formation as they wrote on the board generated a wealth of field notes, mainly because of the incorrect letter formation used. The writing tools used by the learners for the day's handwriting lessons as well as classroom conditions were noted. The main function of the field notes was to provide detail on the observation items on the checklist (see Annexure K), for example, the observation checklist item "[l]earners with special needs present" was clarified by adding "visual impairments" in the field note section.

1.9.4 Photographic evidence

Digital sources such as photographs are considered qualitative data (Creswell & Creswell, 2018:187). Photographs taken with a digital camera were more convenient to obtain than photocopies of learners' written work because the photographs would appear in full colour and would be convenient to store electronically. Photographic evidence was collected of pencil grips and learners' written work directly after the classroom observations. Great care was taken to photograph only the learners' hands in the pencil grip photographs, and these photographs were shown to the teacher before the researcher left the classroom.

1.9.5 Focus group discussions with Grade 1 teachers

A focus group discussion focuses on a specific topic, and an ensuing deliberation may add to the data generation (Merriam & Tisdell, 2016:114). Focus group discussions were held with the Grade 1 teachers where they related their experiences with the implementation and content of the pre-handwriting programme. The participants gave permission to be audio recorded. Focus group discussions was considered the best form of data collection on the implementation of the pre-handwriting programme, as they were expected to provide robust data, while the teachers were expected to elucidate the topic or issue (Merriam & Tisdell, 2016:114). Focus group discussions create opportunities for immediate illumination of responses, as was the case in this study (Merriam & Tisdell, 2016:114).

Although some teachers did not share experiences and ideas freely, the researcher had to act as facilitator and create a comforting atmosphere for all participants to build on the

shared experiences and opinions of the other teachers (Nieuwenhuis, 2019:111), thus ensuring that they expressed themselves freely. As this study was effected in Grade 1 classes, the focus groups consisted of the participants (i.e., all Grade 1 teachers). A focus group discussion is based on the premise that intermingling within a group would extend the span of responses and galvanise smaller specifics of a shared event (Nieuwenhuis, 2019:111). The researcher, as facilitator of the focus group discussions, encouraged communication among the participants. The discussions were initiated with a question, and the researcher then guided the discussions yet remained unobtrusive (Nieuwenhuis, 2019:111). The focus group discussions were envisaged to illicit responses from the teachers, even when confronted with the perspectives, opinions and experiences of their peers (Nieuwenhuis, 2019:111). Therefore, the role of the researcher was to facilitate the discussions by reassuring the teachers that all contributions to the discussions were valued and to ensure that each Grade 1 teacher had an opportunity to offer their opinion, reflection and suggestion.

Thematic guidelines were presented to initiate the focus group interactions and to keep the participants focused on the topic. The guidelines (Annexure N) were as follows:

- What general challenges did you, as Grade 1 teacher, experience with the implementation of the pre-handwriting programme?
- Are there any other experiences that you think are noteworthy regarding the pre-handwriting programme or the implementation thereof?
- What strategies did you use when you noted that a Grade 1 learner struggled to master the activities prescribed in the pre-handwriting programme?

1.9.6 Transcriptions

The researcher transcribed the focus group discussions in preparation for a thematic analysis of the collected data. The focus group discussions were transcribed verbatim. This means that the participants' words were not filtered – the data were presented word for word, including exclamations and interjections (Nascimento & Steinbruch, 2019:419).

1.10 DATA ANALYSIS AND INTERPRETATION

The data were anticipated to be diverse and contrasted, and therefore a thematic analysis

approach was applied for specific themes to be identified. Thematic analysis in this study entailed the identification of themes in relation to the concept of pre-handwriting skills, as well as the activities and the implementation of the programme. The thematic analysis approach was flexible and allowed the researcher to decide what qualifies as a theme (Braun & Clarke, 2006:81; Clarke & Braun, 2018:109). A thematic analysis approach allowed for the detection of recurrent themes encountered by the Grade 1 teachers in implementing the pre-handwriting programme. By reflecting on the recurrent themes, collective difficulties the Grade 1 teachers experienced could be identified (Braun & Clarke, 2016:741). The themes that persisted were coded as noteworthy. The data explained the reasons for the themes to be noteworthy, as the impact it had on the classroom experiences of the Grade 1 learners and teachers became clear (Braun & Clarke, 2016:742). The inductive or "bottom–up" approach was applied, as it explained the methods and classroom experiences of the Grade 1 learners and their teachers (Braun & Clarke, 2006:82-83). The transcripts of the focus group discussions provided valuable data, while the field notes enabled the recall of subtleties in the discussions. Braun and Clarke (2006:23) suggest six phases in the data analysis process. These phases are described below.

- **Phase 1: Become familiar with the data** (Braun & Clarke, 2006:87; Byrne, 2022:1398).

It is vital for the researcher to become engrossed in the data to become accustomed to the complex content. Data collected during the focus group discussions by using audio recordings had to be transcribed. The transcriptions were read and re-read to enable the researcher to become engrossed in the data and to find recurring words and phrases for coding. The consolidated and interpreted data were compared to the transcriptions of the focus group discussions to assess the compilation and implementation of the pre-handwriting programme, whether the issues raised had been suitably addressed and accommodated in the pre-handwriting programme. This would decide the measure of success of the pre-handwriting programme.

- **Phase 2: Generate initial codes** (Braun & Clarke, 2006:88; Byrne, 2022:1399).

After becoming accustomed to the complex content of the data, the researcher made a list of initial ideas. Codes identified specific words and phrases in the data that appeared to be recurrent and noteworthy.

- **Phase 3: Search for themes** (Braun & Clarke, 2006:89; Byrne, 2022:1403).

The initial codes were grouped into possible themes. Different codes were combined to form possible primary themes, as it seemed that sub-themes were evident.

- **Phase 4: Review the themes** (Braun & Clarke, 2006:91; Byrne, 2022:1404).

In this phase, central themes were recognised, as the themes matched meaningfully. The connection between data and codes was reviewed to establish the themes and sub-themes as coherent sets.

- **Phase 5: Define and name the themes** (Braun & Clarke, 2006:92; Byrne, 2022:1407).

Each theme had to have a written analysis, which categorised the themes. The researcher had to identify excerpts from the data to explain and support the themes when reporting on the data analysis.

- **Phase 6: Produce the report** (Braun & Clarke, 2006:93; Byrne, 2022: 1409).

This phase presents the sets of themes in the writing up of the research report. The themes should join logically, presenting the data coherently.

Nieuwenhuis (2019:119) cautions the researcher to be conscious of prejudices when interpreting data and to make every attempt to be objective and sober in understanding the data. By triangulating findings, the researcher moves beyond personal prejudice and assumption and ensures that the reader will be able to see emerging patterns (Nieuwenhuis, 2019:141). Triangulation is established through validation, trustworthiness, transferability, dependability and confirmability (Nieuwenhuis, 2019:141).

1.10.1 Triangulated conclusion

The term triangulation is related to land surveying or navigation; it refers to measured points that converge on a location (Merriam & Tisdell, 2016:244). There are usually three points or aspects, hence the name triangulation. This enables the individual to pinpoint a location or, as in this study, to confer a viewpoint or an opinion. Triangulation is also used in multi-method research designs, where more than one data collection method, leading to the

development of different datasets, are considered and compared (Merriam & Tisdell, 2016:245). In this study, a final conclusion was reached after the data collected from the questionnaires, observations and focus groups were objectively considered.

1.11 TRUSTWORTHINESS

Researchers embed certain procedures in their research activities and reports to establish trustworthiness – namely credibility, transferability, dependability and confirmability (Stahl & King, 2020:26; Nieuwenhuis, 2019:143).

Trustworthiness credits a study with consistent knowledge, the knowledge is presented ethically, and the study reflects realistic results (Lincoln & Guba, 1985; Merriam & Tisdell, 2016:239). According to Lincoln and Guba (1985), four aspects reflect trustworthiness (see table 1.2 below). These four aspects are also discussed at length by Nieuwenhuis (2019:143).

Table 1.2: Trustworthiness (adapted from Lincoln & Guba, 1985)

Element	Measures taken in the study to ensure trustworthiness
Credibility	Credibility implies establishing whether the results of the study are believable. It creates confidence in the authenticity of the findings (Lincoln & Guba, 1985). Member checking was employed at the end of this study (Lincoln & Guba, 1985: 314). This means the data gathered from the participants was randomly reviewed by themselves, as they are the only ones who could legitimately judge the credibility of the results.
Transferability	The study was systematically described in order to enable any person wishing to duplicate the study, or transfer the results to different contexts. The study provides detailed descriptions of the issues that are of interest (Lincoln & Guba, 1985: 125) and also of field experiences. This technique will enable others to decide whether the findings are applicable, and transferable, to other contexts.
Dependability	To confirm that the findings of this study are constant and can be repeated, detailed descriptions are given of the methods employed. The researcher examined the transcripts and also disclosed the findings to a probe audit (Lincoln & Guba, 1985: 366).
Confirmability	Confirmability links data finding to data collection. Data was cautiously monitored to prevent the findings of the study from reflecting any bias, personal opinions or interest of the researcher. As recommended by Lincoln & Guba (1985: 323), opportunities were given for independent examining of the process and findings of the research study. Furthermore, the researcher continuously reflected upon the process to ensure that she adhered to the stipulations of the research study, and remained aware of possible personal bias, opinions or judgements that may have affected her neutrality (Lincoln & Guba, 1985: 73).

1.12 ETHICAL CONSIDERATIONS

Ethics in research are overseen by committees to ensure that the planned research is scientifically and ethically sound and that participants are protected (TRREE, 2014:18). An application was submitted to the Ethics Committee of the North-West University (NWU) (Faculty of Education) to scrutinise and authorise the ethical aspects of this study. Ethical considerations were complied with in accordance with the TRREE course completed by the researcher as well as specific requirements required by the NWU (see Annexure G). Finally, ethical consent was granted by the DoE (Limpopo) via the Office of the Premier (see Annexure H).

a) Informed consent and voluntary participation

Permission was obtained from relevant figures in authority before starting with the study. The institutions and persons were informed in writing regarding what the study entailed, the duration of the study, as well as the possible effects and consequences of the study (Creswell & Creswell, 2018:91). Written permissions were obtained from the following institutions and persons:

- Department of Education (Limpopo) (see Annexure A)
- Participating schools' governing bodies (SGBs) (see Annexure B)
- Participating schools' principals (see Annexure C)
- Participating Grade 1 teachers (see Annexure D)

The school principals were requested to notify the parents of the implementation of the programme (see Annexure E) would benefit their children. The parents were requested to give their consent for their children to be part of this study, by way of their usual school day.

All participants were explicitly informed of the purpose of the study, how the information would be managed, and the duration of the research period. The participants had the option of withdrawing from the research study at any time without any consequences, and voluntary participation was emphasised.

b) Protection from harm

Research ethics dictate that research should be of value to participants and that participants should not be harmed (TRREE, 2014:9). In this study, the Ethics Committee of the NWU

and the Office of the Premier (Limpopo) were satisfied that the study posed minimal risk to the participants. However, the researcher took care to avoid any potential harm to the participants.

c) Privacy, confidentiality, and anonymity

Anonymity was respected by replacing names with aliases in order to protect the identities of participants and schools (Creswell & Creswell, 2018:95). The researcher did not divulge any harmful or embarrassing data of any participant. Participants were reminded in the focus group discussions to respect and honour confidentiality. The focus groups were small, ranging from six to eight participants per group, and no sensitive personal information was shared – only reports on classroom activities. Therefore, confidentiality was easily attainable in this study.

d) Analysis and reporting

The following guidelines by Creswell and Creswell (2018:94) for analysis and reporting were heeded:

- The researcher remained objective and refrained from reporting results that reflect only favourably on the participant teachers and learners.
- The researcher refrained from engaging in scientific misconduct, that is, suppressing, falsifying or inventing findings, because she realised that such conduct would not be beneficial to the compilation of an effective pre-handwriting programme.
- Raw data will be kept safe for a period of five years before being discarded.
- For the sake of transparency, the participants had access to the research results during and after the conclusion of the study.

1.13 LIMITATIONS OF THE STUDY

This study was conducted in sub-rural schools in a disadvantaged community. Should this study be repeated in advantaged communities, the data might differ considerably because of Grade 1 learners' possible previous exposure to perceptual development at the pre-school level. The schools in which research was conducted are under-resourced. This was considered when the pre-handwriting programme was compiled to ensure that equipment was affordable and readily available should it be needed.

1.14 CONTRIBUTION OF THE STUDY

This study resulted in a pre-handwriting programme that should be prescribed by the DBE to provide guidelines to Grade 1 teachers on the preparation needed for learners to embark on the acquisition of handwriting. The content of the pre-handwriting programme might assist Grade R teachers in working towards preparing learners for formal learning in Grade 1. Theoretical knowledge gained from the study may be insightful to administrators of Foundation Phase programmes at the tertiary level. At the school level, SGBs and finance officers could be led to make provision for resources that are needed for the implementation of the pre-handwriting programme, or resources that will further the development of young learners based on the successful implementation of the pre-handwriting programme.

1.15 SUMMARY

This chapter stated the research problem, the aims and objectives of the study, the purpose of the study and the steps that were followed in this study to compile, implement and evaluate a pre-handwriting programme to promote inclusive practices in the Grade 1 classroom. Chapter 2 offers an in-depth review of existing literature on handwriting instruction.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter probes the existing literature that pertains to this study to ground the study in known literature. This can be built on for future efforts to assist learners with handwriting challenges. Questions about and attitudes towards handwriting can be ascribed to the assumption that handwriting develops naturally, with not much thought given to the act of putting pen to paper and producing meaningful marks once the skill has been mastered. Thus, when engaging in a discussion concerning handwriting, especially in an age when computers are used for almost every written task, one question is certain to surface:

"*Why still teach handwriting?*"

Answers to this question were required before the researcher embarked on this study, as the use of computers and technology is a fact that is evident in everyday life, which can undeniably be considered as the main support structure for young learners' learning. However, there are limits, because if one replaces handwriting instruction with keyboard instruction in the lower grades, it can be detrimental to learners' literacy acquisition (MacKenzie, 2019:1). According to Fears *et al.* (2020:172), research has shown that replacing handwriting with typing limits the development of young learners' motor skills. Seeing and hearing the sound of letters are historically passive ways of acquiring letter perception and can be regarded as a precursor to reading (James, 2017:503). Thus, James (2017:503) favours the writing of letters whereby letter perception becomes an active process, which is more effective than seeing, hearing, or even typing letters.

"*So, why do we still teach handwriting?*"

Lifshitz and Har-Zvi (2015:47) and Santangelo and Graham (2016:226) maintain that handwriting is still crucial in the current technological era and especially in schools where most of the work produced by learners appears in handwritten form. MacKenzie (2019) reports that there is a strong correlation between the hand and the brain's neural circuit, meaning that letter recognition is enhanced while the learner is learning to write or form a letter. This, in turn, ensures that the learner recognises letters effortlessly, benefitting reading development. Furthermore, James (2017:504) conducted two studies with the use of brain imaging that showed that the visual regions of the brain are only activated once the young learner is writing the letters compared to the "see-say" method and keyboarding. In

the see-say method, the learner receives verbal instruction on letter formation. The outcome of James' study has shown that handwriting practice – the act of writing and letter formation – is vital for literate brain development and letter recognition (James, 2017:507).

2.2 WHAT IS HANDWRITING?

Joubert (2019:186) differentiates between the concepts of handwriting and writing. Writing is described as the incorporation of literacy and language development, whereas handwriting is the forming of letters and numbers by hand in a chosen script (Joubert, 2019:186). Lifshitz and Har-Zvi (2015:48) describe handwriting as a collaboration of skills in the cognitive (planning), language and motor (eye–hand coordination and in-hand manipulation) domains. As technical as this may sound, handwriting has a personal impact because it allows more time for reflection during the process (Alonso, 2015:266), and the personality of the writer is etched in the graphomotor process (the formation of each letter), leaving a unique signet on the page (Alonso, 2015:269). Although this personal impact influences legibility, the physical appearance of good handwriting is suggested to be proper letter formation, directionality, size of the lettering, the slant of the letters, writing that rests on the line, and even spacing between letters and words (Africa & Van Deventer, 2016:1961; Lifshitz & Har-Zvi, 2015:48). Indeed, a one-year longitudinal study by Guo *et al.* (2021:220) showed writing to be notably related to young learners' proficiency in letter writing and spelling. This confirmed that learners who continued to practise writing words and letters informally obtained higher scores in writing tasks when measured against learners who did not (Guo *et al*., 2021:221).

Finland has abandoned handwriting in favour of keyboarding (Doug, 2019:180), and in the USA, 75% of schools do not prioritise handwriting instruction, while in the UK, handwriting instruction is also fading fast (Doug, 2019:180). Considering these scenarios, Doug (2019:180) explains that the UK is falling behind countries in the Far East, such as Japan, Hong Kong, Singapore, and Taiwan, where handwriting is a key element in education. The latest Programme for International Student Assessment (PISA) report (Schleicher, 2019:5) reveals that China, Singapore, and Hong Kong have outscored the USA and the UK overall. Finland outscored the UK and the USA in reading, while China, Singapore, Hong Kong, and Japan outscored the UK in Mathematics and outscored the USA by a full level. Doug (2019:183) attributes these achievements partly to handwriting because handwriting aids memory. Through writing, learners can recall information, internalise literal knowledge and

revise what has been written, whereas learners seldom revise what has been typed (Doug, 2019:183).

The question "*Why do we still teach handwriting?*" seems to be answered. It is prudent to agree with the evidence in the literature that handwriting is a skill born of cognitive and perceptual development that enables a person to convey a message in a very personal manner. Taverna *et al.* (2020:1) support the view that competent handwriting is a prerequisite for learners' participation in the classroom and suggest that handwriting is a school "survival skill". Therefore, as with so many other skills, handwriting has to be taught and, importantly, taught by skilled teachers.

Despite the identified need for teachers to be trained in handwriting instruction, Sharp and Titus (2016:28) state that many teachers still report on the lack of instruction in teaching handwriting. Moreover, handwriting is often not taught, even in the early school years, and where handwriting lessons are presented, little time is dedicated to the lesson, while instruction methods are inconsistent (Annandale, 2019:52; Fears *et al.*, 2020:172). Furthermore, Fears *et al.* (2020:172) recommend that handwriting instruction happen daily, with a total of 75–100 minutes dedicated to handwriting practice per week.

2.3 THE RELATIONSHIP BETWEEN HANDWRITING AND KEYBOARDING

While technology is appreciated in the 21st century and widely used by young learners, the physical requirements differ for operating pen to operating keyboard (Feng *et al.*, 2019:37). Alonso (2015:265) explains that in handwriting the haptic input (the pen held by hand) and the output (the written result) are both visible at a glance, while with keyboarding, the input and output appear separately as the hands and the screen. Alonso (2015:266) considers this divided attention between hands and screen as a possible negative factor in the quality of retention, because noting down information via keyboarding happens so quickly that minimal memorisation is achieved. In the initial stages of keyboarding, visual feedback guides the finger movements, and this implies that fine motor skills are needed in the finger functions (Weintraub *et al.*, 2010:125). Rosenburg-Adler and Weintraub (2020:82) suggest that the different motor functions needed for handwriting and keyboarding, respectively, also means that different cognitive functions are active during handwriting and keyboarding. Stevenson and Just (2014:50) highlight similarities between handwriting and keyboarding such as motor memory and visual guidance. Table 2.1 (adapted from Stevenson & Just,

2014:51) provides insight into the development of handwriting and keyboarding.

Table 2.1: The development of handwriting and keyboarding (adapted from Stevenson & Just, 2014)

Stage of motor development	Handwriting	Keyboarding
Stage 1 Cognition and vision	**5 years** Each letter is taught explicitly, and the teacher makes use of verbal guidance to demonstrate letter formation before the learners follow the teacher's example.	**10-12 years** The learners can identify the letter and can find it on the keyboard.
Stage 2 Developing motor function	**5-6 years** The learners trace letters by following verbal and visual cues. Practice opportunities are given, to allow for mastery.	**10-12 years** Learners are familiar with home keys and able to find letters from the home keys. Muscle memory develops.
Stage 3 Gradual progression to automaticity	**6-7 years** Motor memory facilitates a gradual progression to automaticity. Learners are ready to embark on self-monitoring. **7+years** Learners start to write with increasing speed, but opportunities for practising should still be provided.	**10-12 years** Muscle memory improves, yet visual guidance is still evident. Gradually, only keys used less frequently need to be found by looking on the keyboard. Speed increases, with daily opportunities for practice.

In line with table 2.1, Stevenson and Just (2014:53) found that learners in later primary school years who struggled with handwriting benefitted from keyboarding. Rosenburg-Adler and Weintraub (2020:87) conceded that keyboarding is often suggested as an alternative for learners with handwriting difficulties, yet they report that 24% of learners experiencing handwriting difficulties also experience difficulties with keyboarding. In a meta-analytic review, Feng *et al.* (2019:58) report that learners taking notes using keyboards tend to type verbatim, as opposed to rewording the information when taking notes in handwriting. This points to written notes as facilitating the internalisation of information, which is beneficial to the learning process (Feng *et al.*, 2019:58; Sut *et al*., 2022:18). Feng *et al.* (2019:58) concluded that the explicit instruction of handwriting is essential for writing development.

2.4 PHYSICAL DEVELOPMENT OF HANDWRITING

As far back as 1971, Rosenbloom and Horton reported that handwriting usually develops according to a dynamic coordination pattern. This pattern starts by writing with body joints (i.e., moving the whole arm), progresses to hand joints and, between the ages of 4 and 6, is refined to writing with the fingers (Rosenbloom & Horton, 1971:6). The age range mentioned by Rosenbloom and Horton overlaps with the school-going age of South African learners. In South Africa, learners enter Grade 1 between the ages of 5 and 7 (DoE, 2007). The South African Admission Policy (DoE, 2007) states that learners may be admitted to Grade 1 at age 5, turning 6 by 30 June in the same year, or at age 6, turning 7 in the same year. This ruling coincides with the age range in which optimal development of handwriting takes place, according to Lin *et al.* (2017:378).

Figure 2.1 below shows the development of the carpal bones in a typically developing male at ages 5, 6 and 7 years, respectively. Hughes and Powling (2018) caution that the young child has a slackness in the tendons until the age of 7 and the carpal bones are not fully formed yet. Thus, the reasoning is that a young learner's hand should not be ready to assume the dynamic tripod grasp at age 5. The recommendations offered by Hughes and Powling (2018) correspond with pre-handwriting skills and play-based learning that should take place at Grade R level. These include drawing on easels and other vertical surfaces with egg-shaped writing utensils, round paintbrushes and sidewalk chalk, and games that develop visual skills, eye–hand coordination, and activities that promote midline crossing and bilateral integration.

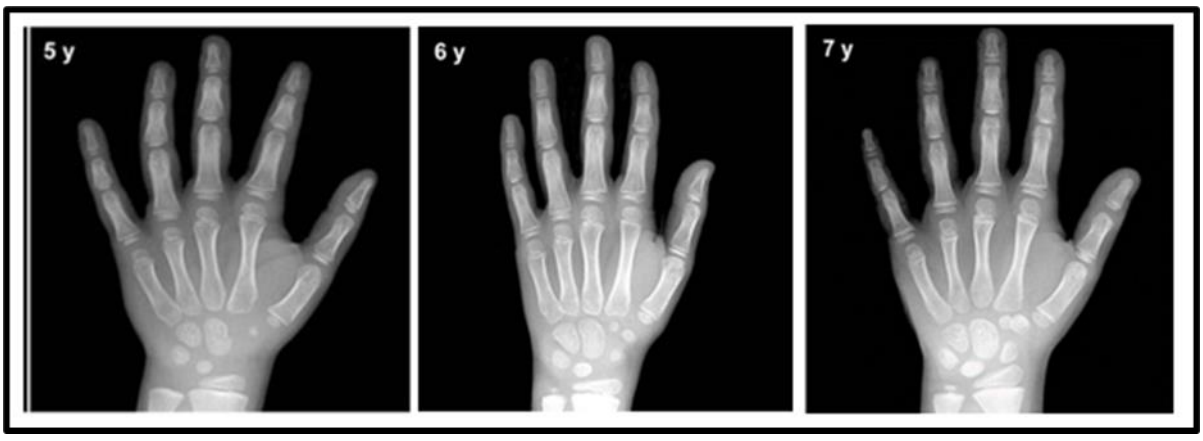


Figure 2.1: Physical development of the hand of a male at ages 5, 6 and 7 years, respectively (Gilsanz & Ratib, 2005)

Bian *et al.* (2020:6) endorse the Tanner-Whitebone (TW) system to determine skeletal maturity accurately. The system shows how bones in the hand and fingers still grow and mature throughout childhood, and how the loose tendons and wider spaces between bones allow for growth. This corresponds with the recommendation by Hughes and Powling (2018) in terms of physical readiness for handwriting.

Lin *et al.* (2017:378) highlighted the period between the ages of 5 and 8 as "critical" due to the development of force control needed for handwriting following their study using a force acquisition pen (FAP). An FAP is a lightweight, 12 cm-long ballpoint pen, fitted with four pressure sensors. The pressure sensors allow the researcher to measure the force applied between the pen tip and the paper as well as the relevant force between the thumb, index finger, middle finger and the shaft of the pen. They measured fluency in handwriting with Taiwanese learners in kindergarten, Grade 2, Grade 4 and Grade 6 (Lin *et al.*, 2017:372). The data for refinement of fine motor skills and the increase in writing speed between kindergarten and Grade 2 showed the crucial importance of handwriting development in this age group (Lin *et al*., 2017:378).

Although most learners reach a level of handwriting proficiency, Santangelo and Graham (2016:226) reckon that 12–44% of primary school learners experience difficulty in handwriting, boys more often than girls. Opponents of OT intervention at an early stage suggest that by forcing the learner to execute correct letter formation, the learner would focus on letter formation rather than on writing and that efficient handwriting and proper letter formation would eventually develop naturally (Lifshitz & Har-Zvi, 2015:48). Conversely, in the natural acquisition of handwriting, Weintraub *et al*. (2010:123) state that handwriting difficulties may negatively affect learners' self-efficacy and their enthusiasm to write and express themselves through writing. It is often found that learners referred for OT seem not to have impaired skills but rather need constructive and consistent instruction on letter formation (Lifshitz & Har-Zvi, 2015:48).

Although it is encouraging to note that insufficient handwriting skills are transitory in most young learners (Duiser *et al.*, 2019:2), it is reported that 6–33% of learners may experience lasting handwriting difficulties and will be referred for OT after one or two years (Duiser *et al.*, 2019:2). From the South African perspective, Van Stormbroek and Buchanan (2019:471) report that in 2015, the OT–population ratio in South Africa was 0.8/10 000, which is one OT per 10 000 citizens. It must be noted that due to the lack of availability of resources, poverty,

socio-economic factors and many other inhibiting factors, the chance of learners obtaining OT services is extremely limited.

2.5 ERGONOMIC COMPONENTS OF HANDWRITING

Equally as important as the academic components of handwriting are the ergonomic components. Banumathe *et al.* (2016:20) regard a proper seating posture and a dynamic pencil grip as components of handwriting readiness. Van Hartingsveldt *et al.* (2015:115) also list seating posture and a mature pencil grip as ergonomic components of pre-writing readiness.

2.5.1 Furniture size

According to Alibegović *et al*. (2020:90) and Domljan *et al.* (2010), learners spend 92% of their time in a traditional classroom in a seated position. On a typical school day, 3% of learners take up a static seating position, 3% are in a dynamic seating position, 3% are in an active seating position or walking, and only 2% are in a standing position (Alibegović *et al*., 2020:90). These figures highlight the importance of school desk and chair size in proportion to learners' physical size. Alibegović *et al.* (2020:90) further concede that learners' height per age group has increased over the last five decades. This increase has reflected an average height increase of learners between the ages of 7 and 10 by an average of 5–7 cm. However, Castellucci *et al.* (2017:95) point out that learners' physical growth seems to correlate with their socio-economic status. It has been established that learners of lower socio-economic status are, on average, shorter than their peers in the same age group, with males and females showing similar growth rates (Castellucci *et al*., 2017:95).

Schools should take cognisance of these facts and adjust their classroom furniture accordingly. Van Hartingsveld (2014:150) cautions that the size of school furniture affects the handwriting of learners. Furthermore, school desks can affect learners' posture, health and ability to learn (Alibegović *et al.,* 2020:90) and therefore impact negatively on the holistic welfare of learners. For example, a desk that is too high would cause a learner to write with hunched shoulders, impair hand movement and bring the head too close to the book, while a desk that is too low would cause the learner to lean forward to stabilise the body, using the free hand to support the head (NHS, 2016). Djordjević *et al.* (2021:77) caution that a chair that is too low would inhibit finger movements and, therefore, letter formation in handwriting.

Figure 2.2: The "cubist approach" to sitting posture for handwriting, with the hip, knees and ankles at 90º

The ergonomically most-suitable desk is at elbow height when the elbows are at the sides of the body (Addy, 2013:1). The desk surface should have a tilted angle to facilitate effective hand and wrist placement while writing (Castelluci *et al*., 2021:2). Furthermore, learners with visual difficulties may find a slanted desktop helpful when copying from the board (Chandler, 2020), as it shortens the distance between the board and the book.

2.5.2 Seating posture

According to Banumathe *et al.* (2016:20), postural instability would cause a learner to tire easily and sprawl over their desk, or they would lean the head on the arms or the desk while engaged in a writing activity. Van Hartingsveld (2014:15) states that learners should be seated with their forearms resting easily on the desk, with their hips, knees and ankles at 90°, their feet flat on the floor, and their back against the backrest of the chair. According to, Castellucci *et al*. (2021:2), this traditionally promoted seating posture, called the "cubist approach", originated in the 19th century, coined by a German doctor, Staffel. The cubist approach to seating is shown in figure 2.2.

Alibegović *et al.* (2020:92) claim that from a biomechanical and physical–medicine point of view, the cubist approach to writing posture can be held by a young learner for only a couple of seconds because it causes fatigue and results in a precarious spinal curve due to the

backward tilting of the pelvis. Castellucci *et al*. (2021:2) support this statement and add that this approach, also called the “90-90-90” position, can cause restricted circulation in the legs due to a lack of muscle movement. Pade *et al.* (2018:643) found that 80% of the time, learners write without their backs touching the backrest of the chair.

Castellucci *et al*. (2021:2) endorse the “dynamic sitting position” recommended by Mandal (1981), saying teachers should allow young learners to sit in a way that enables the learners to move comfortably, as long as it does not interfere with teaching in the classroom. The dynamic sitting position (see figure 2.3) is believed to make the learner subconsciously feel that the muscles in the body are active, enabling the learner to participate in the lesson without hindrance, and learners have also been shown to retain information more successfully (Alibegović *et al.*, 2020:92). Castellucci *et al*. (2021:2) explain the dynamic sitting position as an angle close to 130º between the thighs and the trunk. A curved seat with a slope of approximately 15º aids the opening of the space between the thighs and the trunk and keeps the body in a more vertical position. With the thighs sloping downward, the pelvic angle opens up.

Figure 2.3: The dynamic seating position – with a wider angle between the thighs and the trunk, and a wider pelvic angle

Table 2.2 below points out the differences in sitting positions, as illustrated in figure 2.2 (the cubist approach to sitting) and figure 2.3 (the dynamic sitting position).

Table 2.2: Differences in sitting positions

Staffel's cubist approach to sitting	Mandal's dynamic sitting position
Forearms resting easily on the desk	Based on spinal biomechanisms
Hips at a 90º angle	The angle of 130º between thighs and trunk
Knees bent at 90º	Pelvis tilted forward
Feet flat on the floor	An excessive inward tilt of the spine is prevented
Ankles at a 90º angle to the feet	Less pressure on spinal discs
Difficult for young learners to maintain	Learners have a subconscious feeling that their muscles are constantly active
Fatigue sets in, causing the learner to lose concentration	Facilitates comfortable movement, promoting participation in the lesson, resulting in improved retention

According to Castelluci *et al.* (2017:94), Mandal considered the effects on the body of the learner involved in writing tasks and concluded that a typically developing learner is not able to maintain the rigid posture proposed by Staffel for longer than one to two minutes. Mandal also reportedly considered the effects of the cubist approach on the lower back, as considerable pressure is exerted on the lower area of the spine (Castelluci *et al.*, 2021:2). The angle of 130º between the thighs and the trunk relieves the pressure on the spine by tilting the pelvis forward. This angle still allows learners to sit up straight, with their feet flat on the floor (Castelluci *et al*., 2021:2). This sitting position makes learners feel comfortable, which promotes active participation in the learning process. A rigid sitting position such as Staffel's cubist approach causes fatigue, which leads to a loss of concentration, and ultimately learning is hampered (Castelluci *et al*., 2021:2).

As some of the schools in the sub-rural area involved in this pre-handwriting programme

study were non-fee-paying schools, financial constraints were evident,[10] and some Grade 1 classrooms were furnished with fixed desks, while others were equipped with plastic pre-school tables and chairs. Castelluci *et al*. (2021:2) concede that fixed desk designs are usually used when catering for larger populations because of the cost of more ergonomic, or even adjustable, designs.

2.5.3 Dynamic tripod pencil grip

Kirkwood (2015:56) considers pencil grasp as a problem when it interferes with legible handwriting or when the young writer's hand is easily fatigued. A study by Lin *et al*. (2017:378) confirmed that a dynamic pencil grip is vital in handwriting because the learner grasps the writing utensil comfortably and is able to rotate it to the correct position over the writing surface.

With the dynamic tripod pencil grip, the shaft of the writing utensil should be supported within the web space – that is, the space formed between the thumb and the index finger. The writing utensil should be grasped neither too close nor too far from the tip of the utensil. This allows for optimal in-hand manipulation, which is a significant contributing factor to successful handwriting (see figure 2.4).

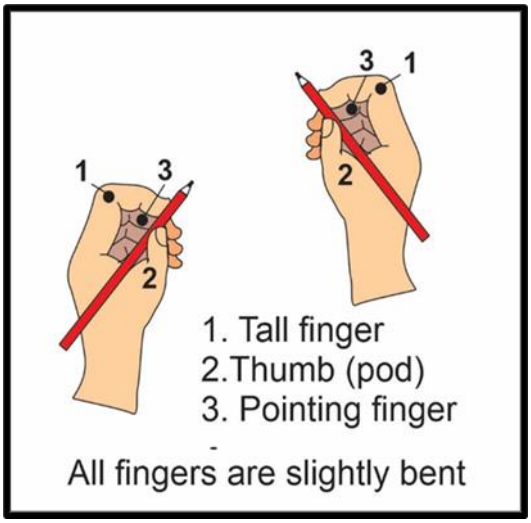


Figure 2.4: The dynamic tripod grip is the same for left- and right-handed learners

[10] http://section27.org.za/wp-content/uploads/2017/02/Chapter-7.pdf

By contrast, an incorrect pencil grip can result in too much pressure being applied, which would cause writing to be strenuous for the young learner's hand, and fatigue would set in (Danna & Velay, 2015:8). Addy (2013:2) points out that heavy pressure on the writing tool would slow down writing significantly, which would have a negative effect on writing speed. Lifshitz and Har-Zvi (2015:50) advise that the wrist should rest on the writing surface to stabilise both the wrist and the writing surface.

Teachers and OTs make use of a variety of strategies to encourage a tripod pencil grip. Kiley (2012), an OT by profession, suggests three strategies. The first is to use shorter pencils, such as golf pencils, as there is simply not enough space for extra fingers on the pencil. The second strategy is to let the little finger and the ring finger enclose an object, such as a small ball of playdough, when these two fingers are curled in towards the palm of the hand. This will occupy the two last fingers on the hand, which will allow the other three fingers to perform a dynamic pencil grip. The third strategy recommended by Kiley is the "pinch and flip". Figure 2.5 illustrates how the pencil should be picked up between the thumb and index finger, then flipped backward towards the wrist, and the pencil thus finds its way naturally into a dynamic tripod grip.

Frevel (n.d.), another OT, suggests a short verse: "In the car, mum and dad sit in front and the three children sit behind". The mum is in the passenger seat and represented by the thumb, while the dad as the driver of the vehicle is represented by the index finger. The three children on the back seat are represented by the middle finger, ring finger and little finger that are tucked into the palm of the hand.

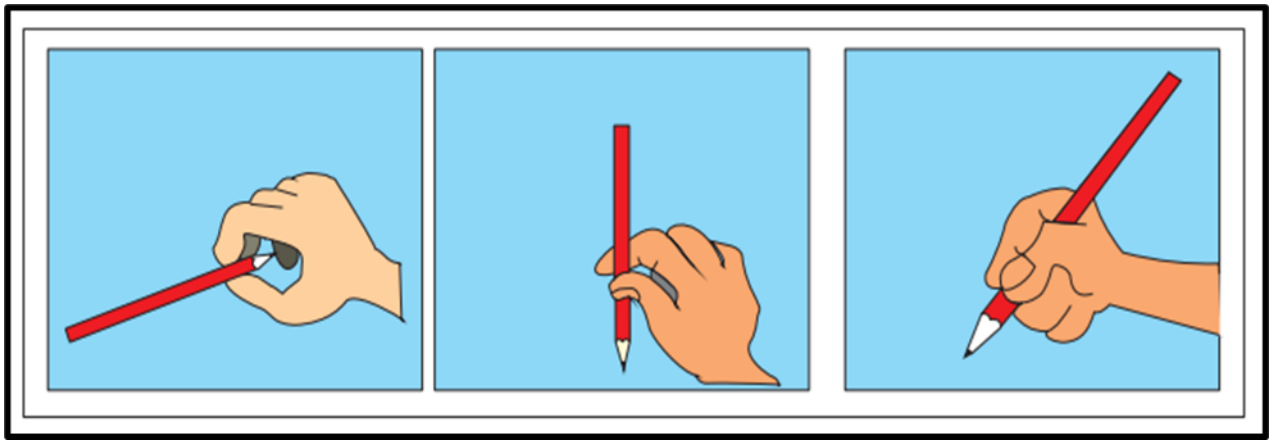


Figure 2.5: The "pinch and flip" strategy for a dynamic pencil grip (Kiley, 2012)

2.5.4 Paper placement

The dominant hand determines the placement of the paper. The paper should be tilted 45º to the right for left-handed learners and 45º to the left for right-handed learners to enable them to see the written work (NHS, 2016). The non-writing hand should rest on the paper to stabilise the paper. In doing so, the posture of a learner's body is supported, enabling them to write freely (Lifshitz & Har-Zvi, 2015:50; NHS, 2016). The paper placement for a left-handed learner is shown in figure 2.6, and the paper placement for a right-handed learner is shown in figure 2.7.

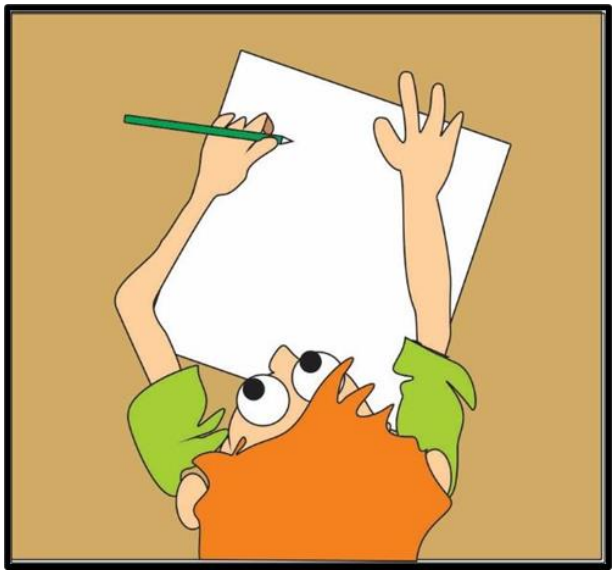


Figure 2.6: Paper placement for a left-handed learner

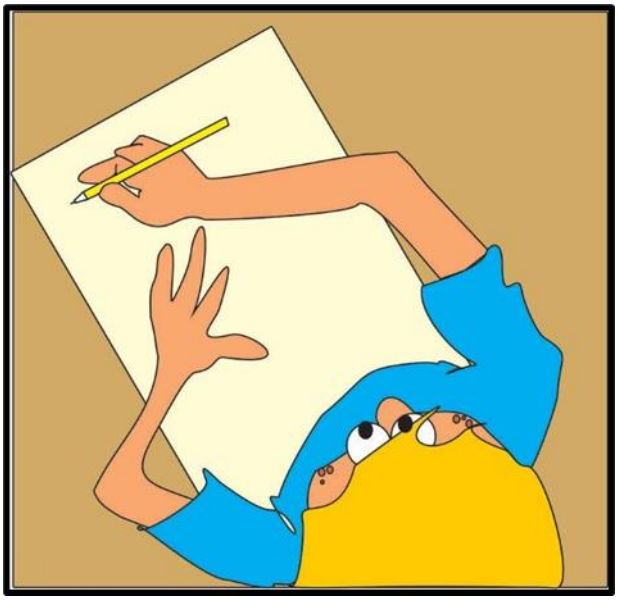


Figure 2.7: Paper placement for a right-handed learner

2.6 COMPONENTS OF HANDWRITING

According to literature, for a young learner to benefit optimally from formal handwriting instruction, a developmental stage of handwriting readiness should be reached in terms of fine motor coordination and visual-motor integration (Van Hartingsveldt *et al*., 2015:115).

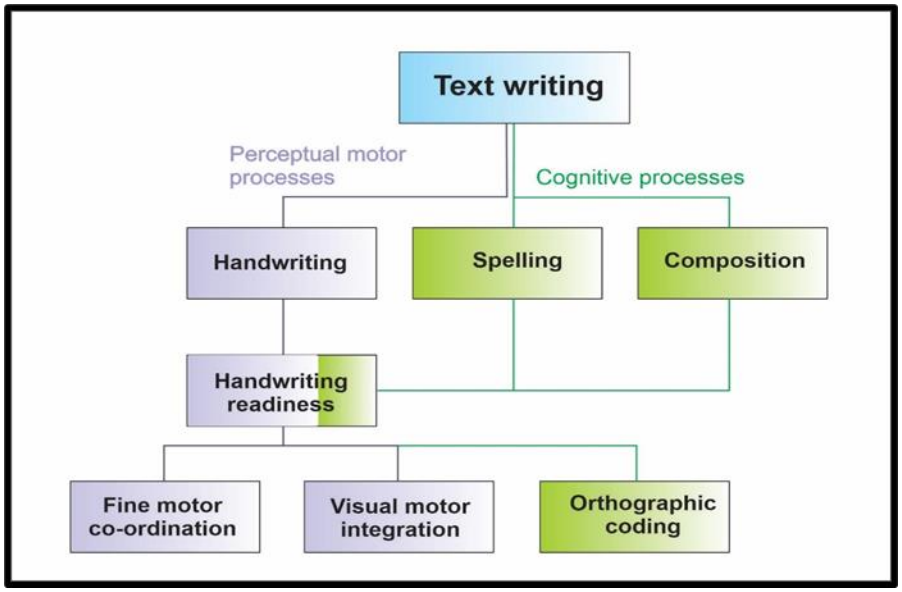


Figure 2.8: Berninger's conceptual model of handwriting readiness (adapted from Van Hartingsveld *et al.*, 2015)

Van Hartingsveldt *et al.* (2015:115) cite Berninger's conceptual model of handwriting readiness that clearly defines the relationship of handwriting (text writing) and the different performance components to the perceptual-motor processes and the cognitive processes (see figure 2.8). The components of handwriting are clarified in § 2.5.1 to 2.5.4.

2.6.1 Perceptual-motor development

Perceptual-motor development was added to instruction techniques in handwriting instruction during the 1980s (Dobbie & Askov, 1995:340). Loubser (as cited in Excell & Linington, 2015:59; De Witt, 2016:82) describes perceptual-motor development as learners' ability to receive information via the senses, interpret the information in the brain, and effect an appropriate motor response. The senses, paired with the motor response, facilitates young learners to reach the stage of handwriting readiness. With explicit instruction and opportunities for practice, learners should ultimately master the skill of handwriting.

2.6.2 In-hand manipulation

Lin *et al*. (2017:377) confirmed Cornhill and Case-Smith's (1996) viewpoint that in-hand manipulation (e.g., rotation skills) influence the quality of handwriting due to optimised control of the fine (small) muscles. Lin *et al*. (2017:377) ascribe this phenomenon to the same muscles that are used for controlling a pen as for manoeuvring small objects. Lin *et al*. (2017:377) continue by stating that in-hand manipulation skills are necessary for writing speed, as this would depend on the strength of the fine muscles in the hand. In-hand manipulation develops over an extended period, between the ages of 18 months and 7 years, but more swiftly between the ages of 3 and 6 (De Vries *et al*., 2015:63). Considering this, a delay in the development of in-hand manipulation may result in an unstable pencil grip because of the weak fine muscles that would not facilitate a firm, lasting and dynamic pencil grip (De Vries *et al*., 2015:63).

2.6.3 Fine motor coordination

De Vries *et al.* (2015:63) describe fine motor coordination as skills displayed by the hand to reach, master and manipulate objects. Kirkwood (2015:56) clarifies fine motor tasks as cutting, writing, colouring and self-care skills, such as managing a zipper, buttons and eating with a fork. Conversely, poor fine motor coordination constitutes a lack of muscle contractions, resulting in irregular stroke speed in handwriting, laborious and illegible handwriting (Chang & Yu, 2013:2434). This finding corresponds with Lin *et al*. (2017:378), who suggest that in-hand manipulation skills should be developed between the ages of kindergarten and second grade, as it is critical to the mastering of handwriting. In South Africa, this would be between the ages of 5 and 7. Joubert (2019:193) emphasises that a dynamic pencil grip enables the manipulation of the writing instrument, and therefore handwriting is dependent on the development of fine motor skills.

2.6.4 Visual-motor integration

Visual-motor integration is described as the synchronisation of visual perception and finger-hand movements (Coetzee *et al.*, 2020:1; Fang *et al.*, 2017:1). Fang *et al.* (2017:6) found that VMI skills are influenced by motor coordination (MC), visual perception (VP), and cognitive plasticity (CP). Cognitive plasticity refers to the flexibility of the brain, the ability to process information, which enables the learner to learn and acquire new skills (Slagter *et al.*, 2011:1). Therefore, young learners with enhanced CP are likely to integrate visual and

motor information better and more automatically without the need for cognitive resources (Fang *et al.*, 2017:6). A cognitive resource translates as concrete external stimuli that may result in the establishment of neural pathways due to experience (Slagter, *et al*., 2011:1). Crespo *et al.* (2018:643) explain that cognitive resources depend on task demands, for example, spontaneous writing compared to copied writing. When engaged in spontaneous writing, such as creative writing, the writer must plan, write and research while paying attention to the purpose, content, style, vocabulary, structure, grammar and spelling. In copied writing, therefore, fewer cognitive processes are employed, and the action of writing is more free flowing. A visual component enables young learners to identify the letters of the alphabet and to write those letters according to size and spacing (Taverna *et al*., 2020:2). Fang *et al.* (2017:1) believe that the VMI skills of Western children usually develop fast and consistently in early childhood; nevertheless, some inconsistencies are evident between the ages of 3 and 7. However, Chinese children who are encouraged to eat with chopsticks from the age of 5 tend to have more advanced VMI skills than American children of the same age (Fang *et al*., 2017:6).

Coetzee *et al*. (2020:6) used June mid-year school assessments and the Annual National Assessment (ANA) to confirm the relationship between VMI, VP and MC and the learning areas prescribed by CAPS. The same study also confirmed that low socio-economic status (SES) harms VMI, PC and MC (Coetzee *et al*., 2020:2). These findings are significant when considering the development of a pre-handwriting programme and even more noteworthy when this programme is aimed specifically at learners and schools in rural and sub-rural areas.

2.7 HANDWRITING INSTRUCTION

Nyman and Kaikkonen (2013:169) acknowledge that newly trained teachers start teaching in the way they have experienced being taught, namely from observation. Yet, Zulfakar (2022:44) posits that in the current progressive education climate, competent teachers would explore a variety of strategies to find the most suitable method of instruction applicable to their classroom situation. In a systematic review, Hall *et al.* (2015:117) identified three different teaching approaches to handwriting: the maturationist, behaviourist/environmental, and constructivist interactionist approaches (see figure 2.9).

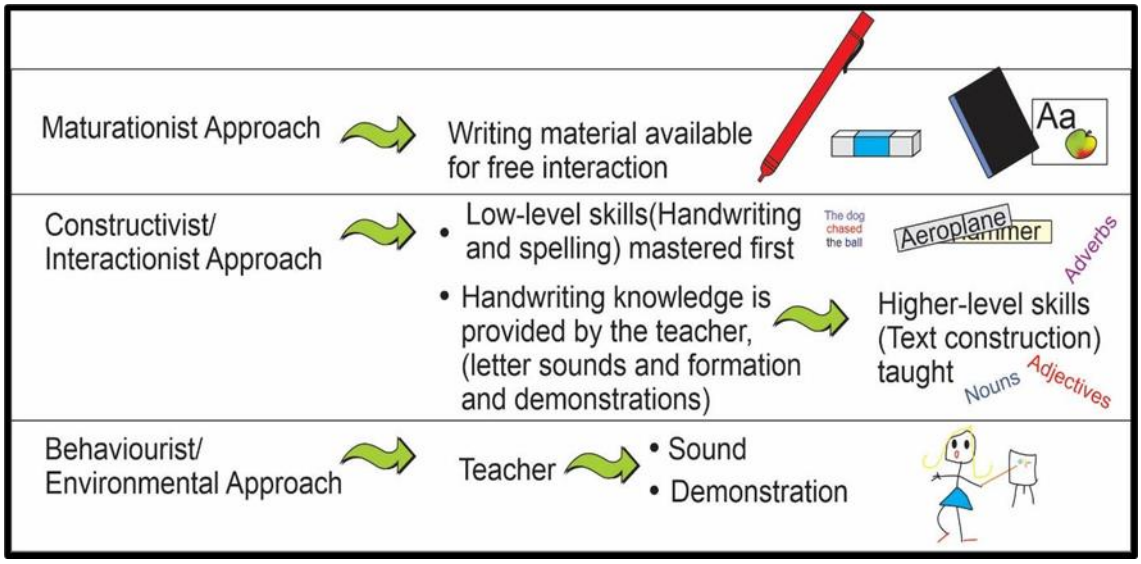


Figure 2.9: Approaches to handwriting (Hall *et al.*, 2015)

- **The maturationist approach**

The teacher following the maturationist approach would make writing materials available to the learners to engage with at will. This approach is grounded in the maturational theory of Arnold Gessell (1940) and suggests that learners develop unique skills as they mature biologically (Hall *et al.*, 2015:117). This provides a level of freedom and choice as learners engage in self-directed activities: writing about their own interests, or copying words that might appear interesting. The teacher fulfils the role of facilitator, availing stationery of different kinds, for example, felt-tip pens, whiteboard markers, chalk, wax crayons, and writing surfaces, such as whiteboards, chalkboards and paper in different sizes and textures (Hall *et al.*, 2015:117).

- **The constructivist approach**

The teacher following the constructivist approach would encourage learners to master lower-level skills, such as handwriting and spelling, first before moving on to higher-level skills, such as text construction. The constructivist approach, also called the interactionist approach, is embedded in social learning theory developed by Vygotsky (1978). The constructivist teacher would teach the letters of the alphabet explicitly as well as letter–sound relations before encouraging learners to write sentences. The constructivist classroom can be expected to be print-rich to provide visual clues for writing (Hall *et al*., 2015:118).

- **The behaviourist approach**

The third group of teachers identified by Hall *et al.* (2015:117) follows the behaviourist approach, also called the environmental approach. This approach views adults as the source of knowledge and therefore reckons knowledge about writing should reach the learner via the teacher. Teachers following this approach would demonstrate handwriting to learners while teaching letter sounds, providing a variety of language experiences and multisensory activities, such as singing, body awareness and perceptual skills to stimulate young learners' interest in writing (Hall *et al.*, 2015:130). The behaviourist teacher focuses on skill-based writing instruction, scaffolded instruction and models writing (Hall *et al.*, 2015:130). Scaffolded instruction is explained by Joubert (2019:345) as a collaborative effort between the learner and the teacher to elevate the learner's capacity, and the teacher gradually steps back as the learner shows competence. Therefore, the teacher would initially provide writing frameworks for learners to complete – for example, "*I like to…*" or "*I see…*" – until the learners are able to formulate their own writing.

Without subscribing to any particular approach to handwriting instruction, Bara and Bonneton-Botté (2018:201) found that learners who have experienced a letter via embodied cognition (forming it with their bodies, or walking on the letter drawn on the floor) were able to conjure up the mental image of forming the letter. Bara and Bonneton-Botté (2018:202) argue that it is thus possible to teach handwriting through gross motor movements and without the learners using a writing utensil at the onset of handwriting instruction. The findings by Bara and Bonneton-Botté (2018:202) are important and encouraging, especially for rural settings, where resources are limited, knowing that learners can receive quality instruction despite limited resources. This should also benefit young learners (aged 5) entering formal learning (see § 1.2.2) and learners not physically ready to master the dynamic tripod grip (see § 0) to make them aware of correct letter formation.

2.8 INCLUSIVE EDUCATION

Inclusive education has been embraced in South Africa (DoE, 2002) because the philosophy of inclusive education allows for a high standard of education to accommodate all learners (Swart & Pettipher, 2016:4). Education White Paper 6 (DoE, 2001) was developed to inform the development and implementation of an inclusive education system (Swart & Pettipher, 2016:16). Philpott (2018:59) states that the Inclusion Policy as per White Paper 6 (DoE,

2001) is more than merely an environmental transfer (e.g., from a special school to a mainstream classroom) – it includes “a sense of belonging: feeling respected, valued for who you are; feeling a level of supportive energy and commitment from others so that you can best fully participate in society with no restrictions or limitations”. In the same vein, Tchombe (2017:22) asserts that inclusion is based on the theory that learners are uniquely different, and therefore schools should adapt to accommodate their diverse needs, enabling learners to reach optimal self-realisation. That being said, White Paper 6 (DoE, 2001:16) acknowledges that some learners may still need specialised support despite an inclusive education system.

Despite the considerable progress made worldwide to ensure that all children have access to education, the World Bank (2018) laments that many children with disabilities are still not accommodated in schools. In a media brief (2018), the World Bank stated that 15% of the world population had disabilities and, at the time, it seemed that learners were mostly excluded from education in low-income countries. The World Bank acknowledged that shortages existed in teacher training, classroom facilities as well as teaching and learning resources but vowed to have all its education programmes disability inclusive by 2025. The World Bank’s commitment to education is expected to benefit early childhood education in South Africa.

2.9 LEARNER SUPPORT AND INTERVENTION IN HANDWRITING

Intervention is best described as planned support to bring about permanent positive change where a deficit exists (Taverna *et al*., 2020:3). Bester and Conway (2021:1) describe intervention as the opportunity for a probable increase in the attainment of learning outcomes for learners in inclusive educational settings. Taverna *et al.* (2020:2) suggest that schools require early intervention programmes to stimulate the development of foundational skills necessary for handwriting during the onset of formal handwriting instruction.

The SIAS document (DBE, 2014) was set to provide schools with a standardised framework for the identification, assessment and provision of programmes for learners that require additional support to achieve full participation and inclusion in schools (DBE, 2014:1). Grade 1 teachers should be the first to recognise handwriting difficulties in Foundation Phase learners, because formal handwriting instruction is offered from Grade 1 (DBE, 2011a:19). They would then, in line with the guidelines in the SIAS document, attempt to assist and

support learners (Preston & Van der Merwe, 2021:1). These teachers would establish individual support plans (ISP) to document the additional strategies used to support learners (SIAS, 2014:10). Should these additional strategies and efforts prove unsuccessful, they would approach the school-based support team (SBST) for advice and assistance (Preston & Van der Merwe, 2021:49). The SBST would, where necessary, request assistance from the district-based support team (DBST), who will ultimately give learners access to specialised support services should additional support strategies prove unsuccessful (DBE, 2014:11).

Specialised support services in terms of handwriting would be OT. Grange (2010:1) explains that OT is meant to assist learners in their learning by improving their visual and perception skills as well as their cognition, gross motor and fine motor skills. This is confirmed by Ohl *et al.* (2013:508), who state that most referrals to OTs are fine motor and handwriting-related. Yet, Ned *et al.* (2020:2) report a national vacancy rate for OTs of 22% and find it alarming that the largest number of OTs are found in the more densely populated urban areas across the country. This diminishes the likelihood of learners in the rural and sub-rural areas of our country obtaining the support they might need in terms of OT. This scarcity and preferred location of OTs underscore the fact that although the sub-rural area in this study (Mankweng) is situated only 30 km from the nearest city (Polokwane), the chances of a learner reaching OT services are slim; this is discounting the fact that such a learner's family might not have the financial means to (a) pay for OT services and (b) to get the learner to Polokwane due to transport difficulties.

Disconcertingly, Taverna *et al*. (2020:3) report that learners experiencing handwriting difficulties might have to attend seven months of OT sessions for direct instruction in fine motor skills and VMI skills. While White Paper 6 (DoE, 2001:7) acknowledges that learning needs may arise because of systemic inadequacies – the absence of a pre-handwriting programme in the prescribed curriculum might be seen as a systemic inadequacy. The need for intervention might be circumvented, or diminished, with a scientifically prepared pre-handwriting programme complementing the CAPS document. Of course, we can opt for the "prevention is better than cure" anecdote, but the researcher would rather compile a pre-handwriting programme with a view to better preparing young learners than have the programme viewed as a bandage.

2.10 THEORETICAL FRAMEWORK

In § 1.6.2, AT was identified as the underpinning theoretical framework of this study. Hashim and Jones (2007:4) describe an activity as a fundamental unit, part of the data analysis, which clarifies actions. It is important that each activity be considered in context, as activities viewed separately would not necessarily be meaningful to the reader. As in this study, each step of the six-step model employed to compile the pre-handwriting programme should be viewed as part of a whole. Each step of the six-step model constituted an activity towards fulfilling the objectives set for this study. With the Grade 1 learners as the subject, the compiled pre-handwriting programme as the object, and the Grade 1 teachers as tools for delivery, AT provided the lens for this study to remain focused on the topic.

2.11 THE MODEL USED TO DEVELOP THE PRE-HANDWRITING PROGRAMME

Curriculum development or the development of any educational assistive tool is a process that systematically organises what will be, must be and is taught (Mulenga, 2018:16). A process is a series of actions and steps that enable organisation of the tasks needed to be taught. Thus, the six-step approach in curriculum development of Thomas *et al*. (2015) describes the development, implementation and evaluation of the pre-handwriting programme intended to develop the skills of educational staff at sub-rural schools in Mankweng, Limpopo province.

With the conceptual framework defined, theoretical framework discussed and a comprehensive literature review conducted, the initial data collection process is now discussed. Although the six-step approach in curriculum development was developed for medical education, it can, and was, successfully applied to inclusive education (see § 2.11.1–2.11.6). Figure 2.10 offers an illustration of the six-step approach in curriculum development as applied to this study.

2.11.1 Step 1: Problem identification and general needs assessment

This first step was to identify the problem that needed to be investigated (Kern, 2016:6). In this study, the identified problem was the void in the CAPS document as regards the lack of a prescribed pre-handwriting programme. A pre-handwriting programme was needed and had to be compiled, as no pre-handwriting programme was readily available. The starting point in the six-step approach was to obtain information from the teachers on the problems

that they and their learners experienced in the teaching and learning of handwriting as well as the resources available for the teaching of handwriting. The teachers had the questionnaire for two weeks and could complete the questions at their leisure (see § 3.6.2.1 as well as Annexure J for the questionnaire).

2.11.2 Step 2: Targeted needs assessment

In step 2, the needs of the target group (in this case, Grade 1 learners) and their learning environment (schools) were assessed, as the pre-handwriting programme (the new, specific curriculum) had to be integrated into the existing (CAPS) curriculum (Kern, 2016:6). The pre-handwriting programme was meant to complement the National Curriculum Statement (NCS), not replacing any element in the CAPS document, and without specific planning needed by teachers – it had to be a complete programme with uniform assessment criteria. During this step, the researcher visited each Grade 1 classroom to observe one handwriting lesson presented by the teacher. An observation checklist (see Annexure K) was used to observe the same aspects in all the classrooms in order to complete an accurate needs assessment that would be representative of the Grade 1 classrooms in the sub-rural area of Mankweng, Limpopo province (see § 3.6.2.2).

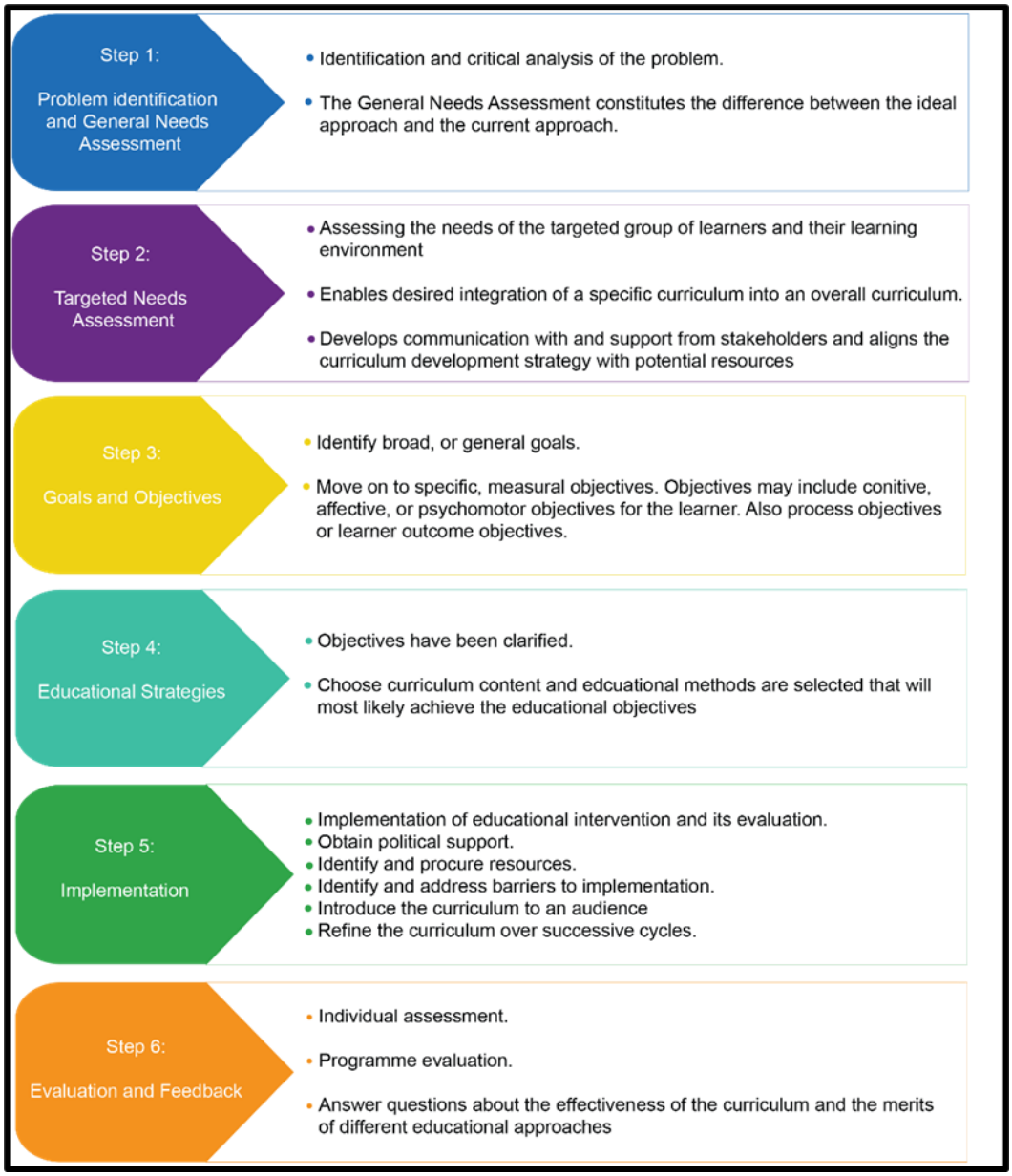


Figure 2.10: The six-step approach employed this study is based on the model for developing a medical curriculum (Thomas *et al.*, 2016)

2.11.3 Step 3: Goals and objectives

Once the targeted needs had been established, the goals and objectives had to be established, as they would be the deciding factor in the choice of curricular content. Kern (2016:7) explains that objectives may include knowledge outcome objectives, attitudinal outcome objectives, or skill and behavioural outcome objectives. Activities had to be selected to address the identified needs in order to support learners in the acquisition of skills needed for handwriting. These activities had to be on the developmental level of the learners, yet supportive of learners who need intervention (see § 3.6.2.3).

2.11.4 Step 4: Educational strategies

With the objectives established, the pre-handwriting content was selected and teaching strategies were investigated that would be best suited to imparting the pre-handwriting programme content (Kern, 2016:7). Equipment needed for the activities had to be everyday items, readily available or, best-case scenario, no equipment needed. Full participation would ensure that learners enjoy the full benefit of the programme, and therefore the programme had to be play-based. This was achieved with the inclusion of songs, rhymes and movement in the activities. The pre-handwriting programme was set for whole-class instruction while ensuring that learners had multiple opportunities to master the activities (§ 3.6.2.4).

2.11.5 Step 5: Implementation

In step 5, the pre-handwriting programme was handed over to the Grade 1 teachers and implemented over a period of six weeks (§ 0). In line with recommendations made by Kern (2016:8), in this step:

- each participant teacher received a bound copy of the pre-handwriting programme;
- the researcher demonstrated the activities in the programme to the teachers;
- teaching resources were provided in the form of coloured bottle tops and laminated arrow charts (see photographs 3.1 and 3.2 in chapter 3);
- the teachers had telephonic access to the researcher;
- the researcher declared willingness to return to school;
- the researcher kept in touch with the teachers via WhatsApp.

2.11.6 Step 6: Evaluation and feedback

The pre-handwriting programme was evaluated by the teachers in three focus group discussions during which teachers were encouraged to speak freely and to give feedback on the choice of activities included in the programme and difficulties experienced with the implementation of the programme (§ 0).

2.12 PRE-HANDWRITING PROGRAMME

The pre-handwriting programme compiled for this study was intended to complement the CAPS policy document. It had to be implemented in the classroom as part of the daily

programme in the time slot set aside for handwriting instruction. A pre-handwriting programme should ideally be implemented in the first six weeks of the school year so that it can lead learners into formal handwriting instruction. However, this was not possible due to the COVID-10 pandemic; the programme was implemented at the six schools from May 2021, and focus group discussions were held in September 2021.

The intention of implementing the pre-handwriting programme within the first six weeks of the school year is that the programme should serve as preparation for formal handwriting instruction and simultaneously serve as a bridging perceptual programme. The period of six weeks should cover half of the first school term. Six weeks are considered long enough for learners to be grounded in the pre-handwriting skills needed for formal handwriting and short enough to enable the teacher to embark on formal handwriting instruction before the end of the first school term. OT-inspired studies spanning nine, 10 and 12 weeks and fine motor and VMI intervention programmes aimed at young learners have reportedly been successful. Four of these programmes are now discussed, as in planning this pre-handwriting programme, the following four programmes were pondered.

Taverna *et al.* (2020:6) made use of age-appropriate games in small groups to stimulate eye–hand coordination and fine finger movements. Ten sessions of 60 minutes each were effected over 10 weeks. The games made provision for in-hand manipulation, finger coordination, and figure–ground perception. The games were progressively pitched at three levels of difficulty (low, medium, and high). The results of this programme showed significant improvements in copying in young learners but not in their fine motor skills. The programme proved successful in Grade 1 learners' VMI and MC but not in their fine motor skills. Taverna *et al.* (2020:6) made use of everyday objects – such as scissors, glue, pencils and markers of different thicknesses, wool and twine threads, tissue paper, pipe cleaners, coloured paper, cardboard, small spheres of different sizes and weight, raisins, peanuts, rice, and pasta for soups in the shapes of letters of the alphabet – required for the completion of activities. Although the above-mentioned stationery seems basic, it would be out of reach for schools in sub-rural areas, where teachers consider paper plates to be an extravagant expense. It must be borne in mind that all six schools invited to participate in this pre-handwriting research study had feeding schemes, and apart from the fact that items such as raisins and peanuts would not be acquired by the school, food items seemed out of place, or insensitive, to use in a pre-handwriting programme in a poverty-stricken area.

The second handwriting programme considered was effected by Axford *et al.* (2018:146). Their intervention programme stretched over a period of nine weeks, with daily sessions of 30 minutes each. This programme is reported to have resulted in improved writing proficiency and enhanced fine motor skills. However, Axford and colleagues made use of 21 iPad applications. However, in the current study, such technology was not considered accessible in the pre-handwriting programme in a sub-rural area.

Third, Ohl *et al*. (2013:512) implemented an intervention programme over 10 weeks, each session lasting 30 minutes. Their focus was on strengthening hand and finger muscles, visual-perceptual skills, visual-motor skills, and bilateral coordination. The results were described as “modestly effective”. The materials used in this study were not specified. The programme involved direct intervention, with the OT being directly involved alongside the teacher, once a week.

Lastly, Ratzon *et al.* (2007:403) implemented an intervention programme with results that were described as “significant”. The programme focused on visual-motor proficiency, multisensory learning, and motor skills. The duration of this specific intervention programme was 12 weekly sessions, lasting 45 minutes each. These sessions consisted of pen-and-paper tasks, such as connecting numbers, dots, or arrows; colouring by number; and tracing mazes. Ten OT students led the sessions, supervised by an experienced paediatric OT.

Having considered these alternative programmes, the researcher compiled the most suitable pre-handwriting programme for this study in a sub-rural South African context. The programme, the core of this study, is discussed below.

2.12.1 The pre-handwriting programme compiled for this research study

The pre-handwriting programme was compiled with success and support in mind. This can be interpreted as Grade 1 learners experiencing a feeling of success when participating in the activities of the programme, even if a measure of support from the teacher is necessary for a learner to master an activity. Limpo *et al*. (2018:1360), after implementing a successful, short intervention programme, recommended that all activities be completed in school time. Therefore, the pre-handwriting programme compiled for this study does not have a homework component. This means that learners were not tasked with activities that required parental input. Secondly, the apparatus and teaching methods for the pre-handwriting programme were carefully selected to ensure accessibility for all learners in a sub-rural area

to enjoy the benefits of this programme. This was done at the recommendation of Barlow *et al.* (2014:506) that a support strategy should have a sustainable and cost-effective approach. Materials needed for the activities in the pre-handwriting programme for this study include plastic bottle tops, pre-used paper, clothing pegs, magazines, wool, and craft paper usually used for art activities in schools. Barlow *et al*. (2014:506) recommend a cohesive scheme wherein both individual and universal strategies are accommodated. This recommendation was heeded, as in this newly compiled pre-handwriting programme, learners participated as individuals in the class group. Thus, learners did not compete against peers; they enjoyed the activities in the company of peers.

Thomas (2016:51) advises that goals and objectives should be set when developing an education programme. This advice was also considered for the pre-handwriting programme for the following reasons:

- to regulate the content and to prioritise the components of the curriculum. Thus, the programme highlighted and prioritised aspects of "equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country" (DBE, 2011a:4);
- to recommend the most effective learning methods, "active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths" (DBE, 2011a:4);
- to allow for the evaluation of the learners as well as the curriculum. In short, to inform teaching strategies, to identify each learner's strengths and areas where support is needed, and to identify systemic needs (DBE, 2011b:12);
- to recommend appropriate evaluation methods (DBE, 2011b:12);
- to convey to all stakeholders what the programme aspires to achieve. This will be done through a report to the DBE once the examination of this thesis has been finalised.

The pre-handwriting programme was compiled, cognisant of the goals and objectives explained by Thomas (2016:51). The activities were carefully selected from a range of activities that hold every possibility to prove successful in their purpose and fun for learners to ensure full participation.

An assessment table appears at the end of each component of the pre-handwriting

programme – for example, at the end of *Body Image*, at the end of *Laterality*, et cetera. The assessment criteria comprise the norm for the three age groups that may be found in a Grade 1 classroom due to the admission policy of South African schools (§ 1.2.2), namely, 5-, 6- and 7-year-olds, respectively. Therefore, they are an unambiguous and user-friendly form of assessment. The assessment tables may enable Grade 1 teachers to assess all learners against the same assessment criteria and in an informal way through observation. Once the Grade 1 teacher considers most or all of the assessment tables, an overall impression of the learner's abilities should become clear. This should enable the Grade 1 teacher to decide on further support strategies. For this study, the pre-handwriting programme was implemented in 16 Grade 1 classrooms in the sub-rural area of Mankweng in the Limpopo province (see Map 1).

2.13 SUMMARY

In this chapter, the frequently asked question of "*Why is it still necessary to teach handwriting in the current technological era?*" was addressed, and handwriting was compared to keyboarding. Handwriting as a skill was fully explained. The key concepts explained in this chapter form part of the conceptual framework of the literature review. The concepts pertaining to this study were clearly identified, described, and the purpose of these concepts was clarified. The concepts identified and discussed were ultimately used to answer the research question:

What should a South Africa relevant pre-handwriting programme look like that will speak to the handwriting development of Grade 1 learners within an inclusive setting?

It is clear from the existing literature that have been outlined that intervention programmes for handwriting in young learners exist, but no pre-handwriting programme could be found in the available literature. This highlighted the need for a pre-handwriting programme for South African schools. The pre-handwriting programme compiled for the purpose of this study was developed from the literature and aimed at South African schools. The following chapter discusses the research methodology to explain how the research was conducted to compile the pre-handwriting programme and implement the programme in a sub-rural area of the Limpopo province.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This study sought to understand what a relevant pre-handwriting programme should look like in the South African context, as well as the relevant elements that should be accommodated in such a programme that would facilitate pre-handwriting development of Grade 1 learners within an inclusive setting. In chapter 2, literature on this topic was reviewed, grounding the study in the most recent, relevant and available sources.

In this chapter, a comprehensive discussion is provided to give the reader insight into the research design and methodology employed in this study. The methodological procedures for selecting participants, the research field, data collection and analysis are discussed, along with the steps employed to ensure trustworthiness. Specifically, the data collection methods are discussed in depth, and comments are made on the impediments experienced during this process. Furthermore, the data analysis process is deliberated on, and particular attention is given to ethical aspects and COVID-19 protocol.

3.2 RESEARCH QUESTION

The research question was as follows:

What should a South Africa relevant pre-handwriting programme look like that will speak to the handwriting development of Grade 1 learners within an inclusive setting?

The secondary research questions were as follows:

- To what extent can fine motor skills (including pencil grip and letter formation), visual memory (including direction, space and reversals), intrinsic physical aspects (including low muscle tone and midline crossing) and extrinsic environmental aspects (including seating position and writing tools) form the basis of a pre-handwriting programme that will assist in the optimal development of Grade 1 learners in an inclusive setting?
- Is it possible to compile a comprehensive pre-handwriting programme with resources that are everyday objects, or easily obtainable, in a rural area?
- Will Grade 1 teachers experience a uniform set of assessments as helpful in the decision to either support, or refer the learner for occupational therapy?

The purpose of this study was to compile a Grade 1 pre-handwriting programme to promote inclusive practices in the classroom, as the present challenge in the current Grade 1 classroom situation regarding pre-handwriting skills prescribed in the CAPS document (DBE, 2011a:19) is that implementation is usually according to Grade 1 teachers' own interpretations of the instruction. With this situation in mind, the outcome of this study could be used to improve inclusive practices, particularly those pertaining to pre-handwriting skills, by standardising the application of the already specified instructions that appear in the CAPS document (DBE, 2011a:19). Therefore, standardisation of current classroom practices on pre-handwriting tasks can provide guidance and direction to educators, especially those new in the service.

3.3 RESEARCH APPROACH

3.3.1 Research design

Qualitative research originates from anthropology, sociology, the humanities, and evaluation (Creswell & Creswell, 2018:13). Sociologists and anthropologists ask questions about people's lives, the social and cultural contexts in which they live and how people understand the world they live in (Merriam & Tisdell, 2016:6). Researchers would go into "the field", carefully observe, conduct discussions, and collect artefacts and documents relevant to the understanding of what they are studying and produce a written, qualitative account of their research (Merriam & Tisdell, 2016:6). Education is considered an area of applied social sciences because education is part of learners' everyday lives (Merriam & Tisdell, 2016:1). Qualitative research methods are deemed most suitable in the field of applied social sciences because this approach explores individuals' and groups' interpretation of human problems (Creswell & Creswell, 2018:4). According to Merriam and Tisdell (2016:24), qualitative researchers are interested in:

- how people interpret their experiences;
- how they construct their worlds; and
- what meaning they attribute to their experiences.

Therefore, qualitative methodology was employed in this study to obtain the views and experiences of Grade 1 teachers in the sub-rural area of the Limpopo province and then to endeavour to compile a Grade 1 pre-handwriting programme to promote inclusive practices

and guide teachers in their efforts to teach handwriting. The present-day challenge is that current classroom practices on pre-handwriting skills, as prescribed in the CAPS document (DBE, 2011a:19), is implemented according to Grade 1 teachers' own interpretations of instruction, as there is no formally stated guide that assists teacher in transferring these skills. Therefore, to explore teachers' experiences of this situation, a qualitative approach enlightened and provided insight into how these teachers navigate this uncertain area of teaching and learning. Furthermore, this study concerns the natural setting (i.e., the Grade 1 classroom) in which learning takes place, which is another important aspect of a qualitative approach. According to Nieuwenhuis (2019:88), a qualitative approach is grounded in a naturalistic setting.

3.3.2 Research paradigm

In keeping with the naturalistic approach, the research paradigm used in this study was constructivism. It is understood that humans seek to understand the world in which they live (Creswell & Creswell, 2018:8). This enables researchers who employ a constructivist paradigm to rely on the enunciations of research participants to construct meaning of the phenomenon under investigation (Creswell & Creswell, 2018:8). Merriam and Tisdell (2016:12) provide an epistemological perspective on constructivism by describing the purpose of the constructivist paradigm as describing, understanding, or interpreting the world in which one's research participants find themselves.

3.3.3 Theoretical framework

Taking the constructivism paradigm a step further, activity theory (AT) was used as a theoretical framework. AT is a theoretical framework that analyses and provides an understanding of human interaction through the use of tools and artefacts (Hashim & Jones, 2007:1). AT provides a holistic and contextual metatheory to explore and discover human interactions, which supports qualitative and interpretative research (Hashim & Jones, 2007:1). As this theory was used as a metatheory, different aspects of the theory were used to underpin various aspects of the study (see § 1.6.2). This section highlights the general application of the theory to the current study as well as the theoretical application of the theory on a more contemporary level by connecting the actions of the researcher to AT. In this section, discussions present a deeper connection between AT and the study.

AT proposes that learning happens when learners are engaged in activities and emphasises

the practical role humans play (Lim & Liang, 2020:528). This was evident, as in this study, the learners and teachers as well as the researcher were all active role players in the "activity system" of assessing and initiating a pre-handwriting programme. Engeström (as cited in Lim & Liang, 2020:528) extended AT with the concept of "activity system analysis". According to this concept, the activity system is viewed as an object-orientated, tool-mediated collected effort. Thus, in the case of this study, the pre-handwriting programme was an object-orientated, tool-mediated collected effort.

In this study, object-orientated would be assigned to the pre-handwriting programme. This "task or assessment" (Engeström as cited in Lim & Liang, 2020:528) is aligned with the outcome (handwriting) at the one end of the system, and teacher and learner (the subjects), at the other end, as illustrated in figure 3.1. The tool-mediated aspects can be translated as technical tools that work on objects, or psychological tools that mediate the mind and environment, thus facilitation by the teacher and/or writing by the learners (Ding, 2021). AT is a very accurate reflection of what happened in Grade 1 classrooms where the teachers facilitated the pre-handwriting programme to the benefit of the learners.

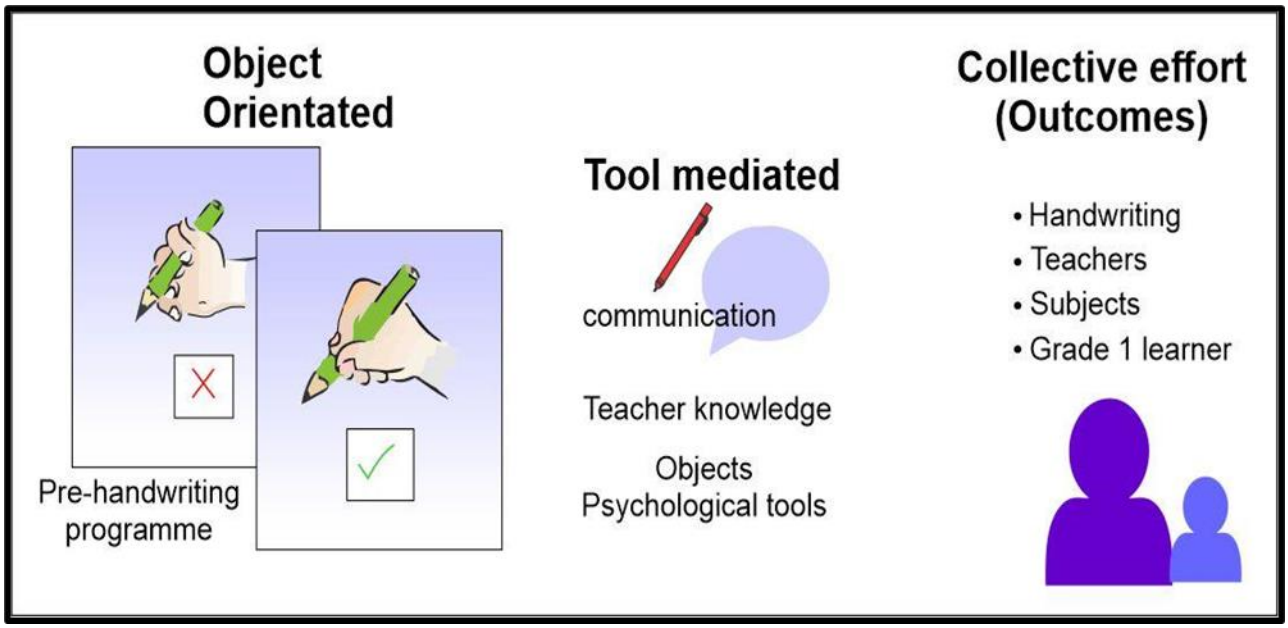


Figure 3.1: Activity theory as a metatheory

3.4 ROLE OF THE RESEARCHER

The task of the researcher was to understand the difficulties experienced in the teaching

and acquisition of handwriting in order to determine the extent to which fine motor skills, visual memory, intrinsic physical aspects and extrinsic environmental aspects should form the basis of a pre-handwriting programme that would assist in the optimal development of Grade 1 learners in an inclusive setting. Thus, the researcher's role was to find out whether it was possible to compile a comprehensive pre-handwriting programme with resources that are everyday objects, or are easily obtainable, in a sub-rural area. I had to determine whether a uniform set of assessments would enable Grade 1 teachers to make an informed decision as to whether to assist a struggling learner or to refer such a learner for OT.

The purpose of the study was explained to the participating school principals and the Grade 1 teachers prior to the beginning of the study. The researcher explained her role in the study, namely that she would be unobtrusive in the classroom during the classroom observations; that she would demonstrate the activities to the teachers before handing over the pre-handwriting programme; and that she would only visit the teacher upon request for assistance during the implementation stage of the pre-handwriting programme. Furthermore, she would act as facilitator only during the focus group discussions. This clarification of the researcher's role served to embed a sense of special purpose in the participating teachers – namely that they were central to a meaningful study.

The significance of the participants' lived experiences stemmed from the data that were collected from questionnaires completed by the teachers, during classroom observations, focus group discussions, field notes, and photographic evidence of learners' work. In the end, the role of the researcher was to compile a pre-handwriting programme to promote inclusive practices in the Grade 1 classroom and to explain the process of its conception in this thesis.

3.5 SAMPLING

Purposive sampling was used to sample the participants for this study, because Grade 1 teachers form a segment of the population that experienced the same phenomenon. Thus, it was assumed that these teachers would be able to provide data that would answer the research questions (De Vos *et al*., 2013:232), as they had insight into the phenomenon under investigation. Creswell and Creswell (2018:185) state that research participants may be purposely selected and they would enable the researcher to fully grasp the problem and then answer the research question.

The schools were selected on the grounds of being public schools under the administration of the DoE, situated in the sub-rural area of Mankweng. Six schools were selected because of their proximity – that is, they were easily accessible by road, albeit gravel roads. The participants were selected because they were Grade 1 teachers and they taught handwriting to Grade 1 learners. All the Grade 1 teachers in the six schools volunteered to participate in this study. A total of 16 Grade 1 teachers participated.

3.6 DATA COLLECTION PROCESS

3.6.1 Introduction

The data collection process was executed in line with the six-step approach in curriculum development as proposed by Thomas *et al*. (2016). The process started with the participating Grade 1 teachers completing questionnaires, followed by classroom observations where one handwriting lesson was observed in each Grade 1 classroom. During the classroom observations, field notes were taken, and photographic evidence of learners' pencil grip and written work was collected. The process was used to compile a pre-handwriting programme. The process continued with the implementation of the pre-handwriting programme, followed by focus group discussions on the implementation thereof in terms of difficulties, successes and the content of the pre-handwriting programme.

3.6.2 The six-step approach in curriculum development

The initial data collection process started by the researcher applying the six-step approach in curriculum development (Thomas *et al*., 2016), which proved effective in obtaining a good background to the situation in sub-rural areas in which the researcher wanted to implement the pre-handwriting programme. In this study, the six-step approach (based on the model for developing a medical curriculum) by Thomas *et al.* (2016) covered many of the aspects of the data collection process, as this overarching approach directed these activities. The six-step approach is discussed next.

3.6.2.1 Step 1: Problem identification and general needs assessment

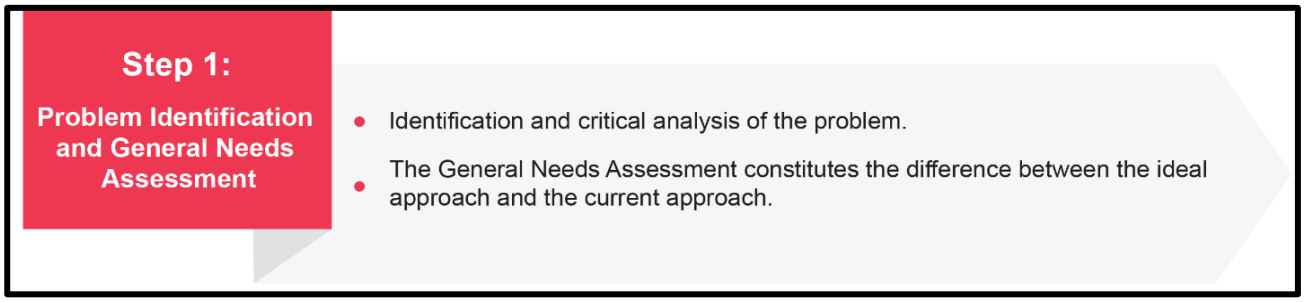


Diagram 3.1: The Grade 1 teachers completed questionnaires to obtain their views on the teaching of handwriting

The first step in trying to answer the research question was to assess the sub-rural environment and obtain participating Grade 1 teachers' views on the teaching of handwriting. This was done through a general needs assessment. Questionnaires were handed out to the teachers (see diagram 3.1). The teachers were requested to specify the difficulties they experienced in teaching handwriting as well as the difficulties Grade 1 learners experienced in handwriting. The teachers also had to indicate how they addressed the difficulties experienced by the learners and the materials used in class during handwriting lessons. This study then proceeded with a more specific needs exploration in an effort to understand how handwriting lessons were presented in Grade 1 classrooms in the sub-rural area of Mankweng. This led to the targeted needs assessment.

3.6.2.2 Step 2: Targeted needs assessment

Diagram 3.2: Classroom observations and evidence of learners' written work gave evidence of needs

Step 2, as shown in diagram 3.2, entailed visits to the Grade 1 classrooms. The researcher observed one handwriting lesson presented by each Grade 1 teacher. An observation checklist was used as an instrument for uniformity (see Annexure K). This proved insightful, as the researcher could observe letter formation as demonstrated by the teachers, pencil grasps of the learners, the classroom environment, and resources available. Field notes

were taken to remind the researcher of aspects that would be beneficial in the data analysis process, for example, the writing tools used by the learners and the books they wrote in. The researcher also had the opportunity to collect evidence of learners' written work from the beginning of the year. It was also an opportunity to build a relationship with the teachers in preparation for the focus group discussions to ensure free and full participation. From this step, the researcher could then reflect on the goals and objectives of the pre-handwriting programme that were about to be constructed. This meant that specific contextual issues could be addressed with this foresight to assist learners in sub-rural areas by creating an inclusive environment.

3.6.2.3 Step 3: Goals and objectives

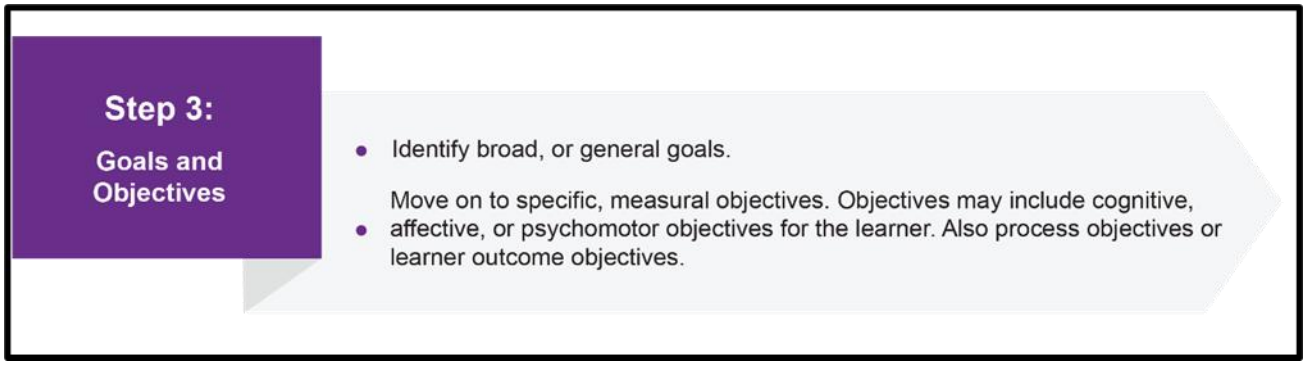


Diagram 3.3: Classroom observations yielded data that contributed to the compilation of the pre-handwriting programme

The questionnaires and classroom observations yielded primary data, and in conjunction with the field notes generated during these visits, insightful and useful descriptive data were obtained. In step 3, as illustrated in diagram 3.3, the collected data were used to identify the goals and objectives of the pre-handwriting programme. The goals and objectives proved to be mainly aimed at psychomotor skills (such as the exercises in laterality, directionality and fine motor skills), but also affective skills (such as the body image exercises, songs and rhymes) and cognitive skills (such as exercises in visual discrimination and midline crossing). With the information of the specific needs identified in the previous steps, a cross-integration of the necessary skills, activities and handwriting exercises to assist teachers permeated the subsequently compiled pre-handwriting programme. Thus, steps 1 and 2 provided a sound, appropriate and applicable foundation for the pre-handwriting programme.

3.6.2.4 Step 4: Educational strategies

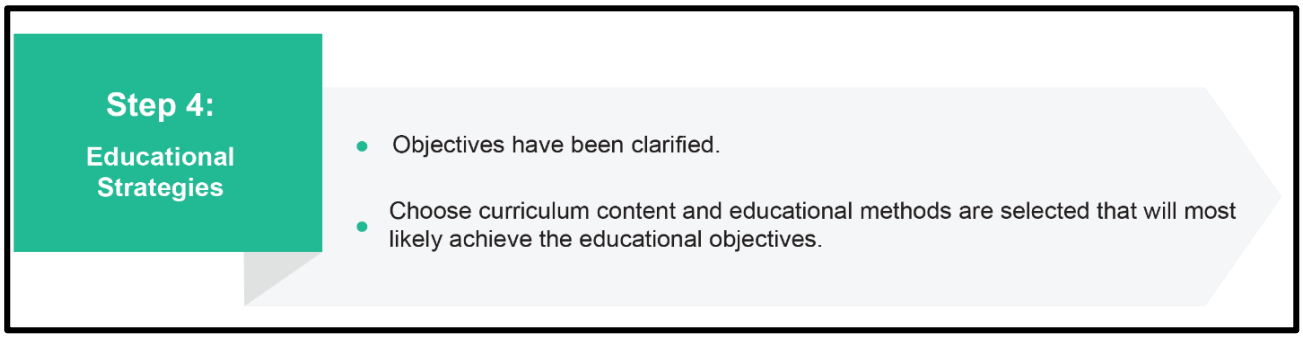


Diagram 3.4: Each activity was carefully selected to provide for the needs identified in the questionnaires, classroom observations and evidence of challenges in learners' work

As outlined in diagram 3.4, the curriculum content of the pre-handwriting programme was carefully selected to address the specific needs and challenges identified in the questionnaires, the classroom observations, examples of the learners' work and the field notes. In addition to the purpose and functionality of the activities in the pre-handwriting programme, careful attention was paid to play-based activities that learners could enjoy and have fun with while working towards mastery of the skill of handwriting.

3.6.2.5 Step 5: Implementation

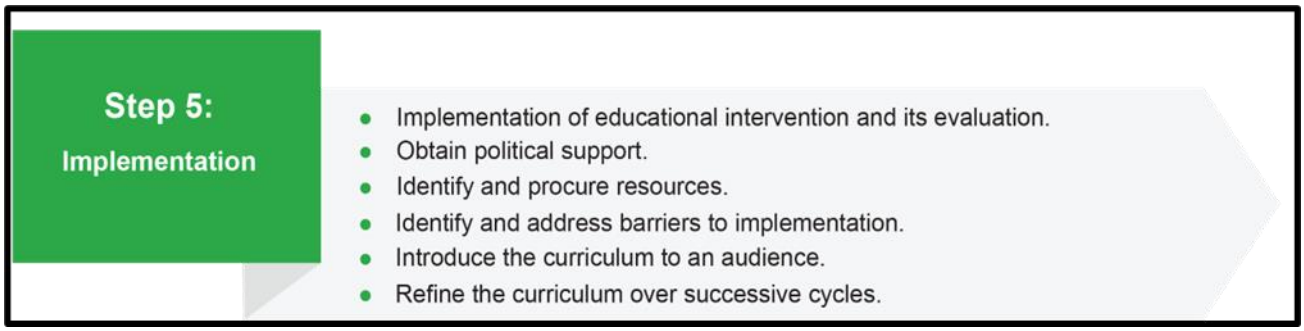


Diagram 3.5: The proposed pre-handwriting programme was compiled and handed to the teachers, with teaching and learning aids and demonstrations of the execution of the activities in the programme

Step 5 was the celebrated implementation stage of the pre-handwriting programme, shown in diagram 3.5. A pilot draft of the pre-handwriting programme was handed over to the participating teachers, with a demonstration of the activities. The programme was compiled around the resources available at the schools; the teachers were provided with a laminated

arrows chart for the exercises in laterality and 10 sets of plastic bottle tops for the exercises in directionality and position in space (see photographs 3.1 and 3.2).

3.6.2.6 Step 6: Evaluation and feedback

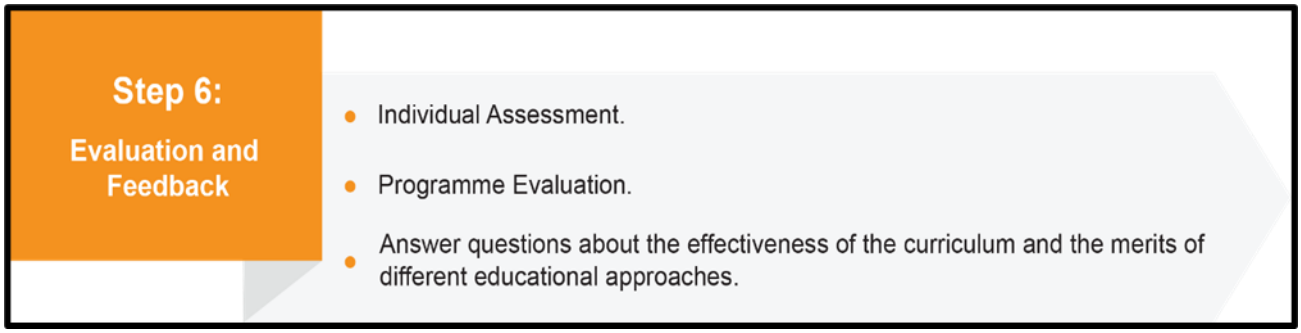


Diagram 3.6: Focus group discussions were held with the Grade 1 teachers, and evidence of learners' written work was collected

Step 6 (diagram 3.6) – the final step in the development of the pre-handwriting programme – was the stage of evaluation and feedback. The teachers were expected to evaluate each activity during implementation and provide feedback during the focus group discussions. Comments and suggestions were welcomed on the type of activities included in the programme, difficulties experienced during implementation, and activities that should be removed from or added to the programme. The outcomes of the focus group discussions are discussed at length in chapter 4.

3.7 THE PROPOSED PRE-HANDWRITING PROGRAMME

The proposed pre-handwriting programme was meant to fill the void in the CAPS document (DBE, 2011a:19) by providing a programme where none has been prescribed. The intention was that the activities suggested in the programme should be implemented in the time slots set aside for handwriting instruction in the CAPS document (DBE, 2011a:19). In view of this whole-class instruction period of 15 minutes per day, four days per week (DBE, 2011a:9), the proposed pre-handwriting programme was compiled using a learner-centred approach, as recommended by Maguvhe and Magano (2015:62), to enable all learners to participate in the programme and to provide support to learners who need support. Activities included in the proposed pre-handwriting programme were carefully selected to speak to the difficulties identified by the Grade 1 teachers and the factors discussed in § 3.7.1 and 3.7.3. Further considerations included the participation of the learners, the time available (15

minutes) and the use of everyday objects. These activities were linked to assessment standards according to developmental ages of 5 to 7. Other aspects that were considered are indicated in chapter 2 (§ 2.5.1–2.5.4), namely perceptual-motor development, in-hand manipulation, fine motor coordination, and visual-motor integration.

Additional noteworthy aspects were also considered while designing the pre-handwriting programme as established from the previous study of Annandale (2019). In chapter 1 (§ 1.5), various difficulties were identified (Annandale, 2019:42), namely fine motor skills, visual memory challenges, as well as intrinsic and extrinsic aspects. These aspects were also evident in the current study and are briefly discussed below, as these factors were included in the pre-handwriting programme.

3.7.1 Intrinsic factors

3.7.1.1 Fine motor skills

The pre-handwriting programme had to address the development of fine motor skills, which would enable learners to acquire a dynamic tripod pencil grip (see § 0). This effective pencil grip, together with dexterity, would facilitate correct letter formation. Thus, it was crucial.

3.7.1.2 Visual memory

Visual memory is an intrinsic physical aspect that enables the learner to remember what a letter should look like, how to form the letter from a specific starting point, the direction in which the letter should be formed, and the amount of space the letter should take up, making this aspect noteworthy.

Apart from the above-mentioned, specific intrinsic aspects and others of a more overt physical nature were also taken into consideration, namely low muscle tone, maintaining seating posture, and midline crossing that enables learners to write from left to right while maintaining the same letter size throughout.

3.7.2 Extrinsic factors

3.7.2.1 Furniture size

Extrinsic environmental factors include ergonomics, such as desk size and chair size, which

influence seating posture (§ 2.3). This was a prominent issue in the sub-rural school environment where resources were extremely strained and schools had to make do with what they had. Furniture, unfortunately, was a low priority.

3.7.2.2 Instruction

Instructional aspects, such as the teaching of handwriting, can be described as extrinsic factors because the pace of instruction should be in keeping with the developmental age of the learners. It is believed that the teacher's enthusiasm can have an influence on learners' motivation to participate in activities. In this study, both these aspects were noted, as many of the learners in the grade were young (5 years old) and others experienced developmental and physical problems. Furthermore, the teachers were not always fully-trained Foundation Phase teachers.

3.7.2.3 Tools and apparatus

A potent extrinsic factor that was considered in this pre-handwriting programme was the apparatus needed for the suggested activities. Using every-day, easily accessible items would naturally facilitate the pre-handwriting programme. Therefore, the pre-handwriting programme included everyday objects to perform the activities. Using everyday objects ensured that enough materials were available to the learners, because everyday objects are affordable and even free when recyclable items are used. It was with this in mind that the researcher used recycled objects to facilitate the apparatus used in the pre-handwriting package given to the participating teachers.

3.7.2.4 Inclusion

The inclusion aspect of the proposed pre-handwriting programme laid in the accessibility of the programme to all the learners. The concept of inclusion highlights that learners should not be marginalised in any manner. Therefore, in the acquisition of handwriting, most of the learners in the classroom should be able to participate in the activities suggested in the pre-handwriting programme. The activities suggested in the pre-handwriting programme should enable the teacher to accommodate the diverse needs of learners in the classroom (Maguvhe & Magano, 2015:68). This was one of the main concerns the researcher addressed when she considered the pre-handwriting programme, leading to the use of

recycled material to assist these resource-strained schools in facilitating participation of all learners.

3.7.4 Assessment

As mentioned in chapter 3 (§ 3.2), learners with an age difference of up to two years can be found in the same Grade 1 classroom (Loubser *et al*., 2016:55). A uniform assessment standard would enable teachers to assess each learner objectively, which, in turn, would enable teachers to reach a decision as to whether to refer struggling learners for OT or to support these learners in the classroom. Such a decision would be based on an overall view of each learner's performance in the suggested activities in the proposed pre-handwriting programme. To ameliorate this challenge, the norms for the developmental level of learners aged 5, 6 and 7 years, respectively, were provided at the end of each section of the pre-handwriting programme (§ 2.11.1). The inclusion of these three age groups would cover the different ages that one can expect to find in a Grade 1 classroom in South Africa due to the admission policy enforced by the DBE (§ 1.2.2).

3.8 THE PRE-HANDWRITING PROGRAMME PACK

3.8.1 The concrete resources

The researcher returned to the schools a few weeks after obtaining the observational data and handed over a full-colour hard copy of the compiled pre-handwriting programme to each of the 16 Grade 1 teacher participants. The pre-handwriting pack included an arrows chart – the use of which is described in § 0 – which facilitated teaching directionality. Each school received 10 sets of coloured bottle tops (one red, one green, one blue, one yellow, and one white, as shown in photograph 3.2 below) to be used in the directionality activities (as described in § 0).

All of the participating schools received counting cubes in a variety of colours from the DoE. These counting cubes are meant for use in mathematics in the Foundation Phase classroom (DBE, 2011a:16). This meant that the researcher did not have to provide the schools with more sets of coloured bottle tops, as the teachers could use the counting cubes for the directionality exercises, for example, instructions such as: "Put out a blue block. Put a red block to the right of the blue block. Put a yellow block on top of the red block. Put a black block in front of the blue block."

Photograph 4.1: The pre-handwriting programme and the laminated arrows charts

Photograph 4.2: Ten sets of coloured bottle tops to be used in the directionality and position in space activities

3.8.2 The pre-handwriting programme manual

When the pre-handwriting pack was handed over to the teachers, the researcher demonstrated the activities that featured in the programme. The programme was labelled as a “pilot draft” (see photograph 3.1), as this was the initial and first compilation, and would

be refined after the focus group discussions had taken place, where the teachers had the opportunity to give feedback on the programme. The pre-handwriting programme manual contained written instructions with accompanying photographs of a pre-school child performing the activities. The activities were very basic, easy to follow and required either no apparatus or everyday objects as apparatus, such as the learner's own chair for doing chair push-ups, sheets of used printed paper or newspaper to crumple into balls for fine motor exercises, and the classroom dustbin to use as a target when throwing the crumpled ball of newspaper into the dustbin for eye–hand coordination.

3.8.3 The pre-handwriting programme

The programme consisted of a foreword that assured the teacher that this pre-handwriting programme was meant to complement the CAPS document. The foreword was followed by a table of contents. Throughout the programme, three to four activities were provided for each programme component, which gave the teachers freedom of choice and the opportunity to vary activities as they thought fit. At the end of each section, an assessment table was added to make it easier for the teacher to indicate the level at which the learner was functioning for that particular component. The table showed the level of functioning of a learner at 5, 6 and 7 years of age.

3.9 THE PRE-HANDWRITING PROGRAMME EXPLAINED

The information gained from following the six-step process (Kern, 2016) included questionnaires completed by the teachers, the classroom visits by the researcher, field notes made by the researcher, and photographic evidence collected by the researcher (see § 1.9.1–1.9.6 and § 3.6.2.1–3.6.2.4). The gathered information, with previous findings as shown in Table 1.1, were used to compile the pre-handwriting programme, which is discussed next.

3.9.1 Warm up

Atkinson (2020:1) recommends warm-up exercises to prepare the muscles for writing and also as a transition activity from one task to the next. During the observations, none of the teachers made use of warm-up activities before embarking on the handwriting activity (see Annexure K). Thus, in accordance with the six-step approach by Kern (2016:7), an observation checklist was used in step 2 as a targeted needs assessment (see § 1.6.2.2)

and incorporated into the pre-handwriting programme.

On page 4 of the pre-handwriting programme, simple exercises are described to warm up the shoulders, wrists, and fingers. The warm-up activities required no additional equipment – only the learners' bodies, their desks, and a pencil.

3.9.2 Body awareness

Krog (2020:329) reckons that learners' total development is based on the awareness of the self and their abilities. De Witt (2016:126) and Grové and Hauptfleisch (1992:130) claim that body awareness helps learners to position themselves in their environment. Thus, laterality, dominance, midline crossing, directionality and position in space are concepts associated with body awareness. The learner needs to be well acquainted with these concepts before letter formation can be taught. For example, when the teacher explains that "e" is formed by writing a short horizontal line, followed by an upward movement to the left, the learners should know where "up" and "left" are (De Witt, 2016:100; Grové & Hauptfleisch, 1992:130).

The researcher wrote six rhymes about body image to help strengthen the concept of body image. Although the pre-handwriting programme is written in English, rhymes appear in English and were translated into Sepedi, which is the most-used indigenous language in the area of Mankweng. No apparatus or music player was required for these activities.

3.9.3 Laterality

Laterality is an inner perception or knowledge of the two sides of the body – a left side and a right side (Krog, 2020:331). Learners must be familiar with the left and right sides of their own body before they would be able to know left from right in their environment (De Witt, 2016:100; Grové & Hauptfleisch, 1992:130). Reversals can be attributed to a deficit in laterality (Grové & Hauptfleisch, 1992:130). Krog (2020:331) concurs by highlighting deficits in laterality manifesting in reversals of the letters d and b, left/right confusion, lack of body coordination, and messy schoolwork.

The arrows chart is an activity included in the programme to promote laterality. For this activity to be successful, each teacher received an A3-size laminated arrows chart (see photograph 3.1). The activities in the arrows chart are progressively challenging but vastly enjoyed by young learners. The researcher was recorded demonstrating the use of the arrows chart. The private link (https://www.youtube.com/watch?v=jVFXOnGLgcY) to the

video was shared electronically with the participants.

3.9.4 Dominance

Dominance is the partiality of one hand or one side (either the right or the left side) of the body over the other (De Witt, 2016:100; Grové & Hauptfleisch, 1992:131). Dominance can be noted by simply observing the learner. The young learner would use the dominant hand more often than the non-dominant hand until dominance is established, whereafter the learner would immediately reach for the pencil using the dominant hand. Handing the learner a toilet roll inner and asking the learner to look at you through the tunnel of the toilet roll inner using only one eye, the learner would automatically use the stronger (dominant) eye. Similarly, when asked to kick a ball, the learner would use the dominant foot. To ascertain the dominant ear, the learner can be handed the teacher's wristwatch and asked to listen whether the watch is ticking. Even if it is a digital watch, the learner would take the watch directly to the dominant ear. The learner should have a dominant hand, eye, ear, and foot. Learners must never be forced to change from their dominant hand, eye, or foot (De Witt, 2016:100; Grové & Hauptfleisch, 1986:525).

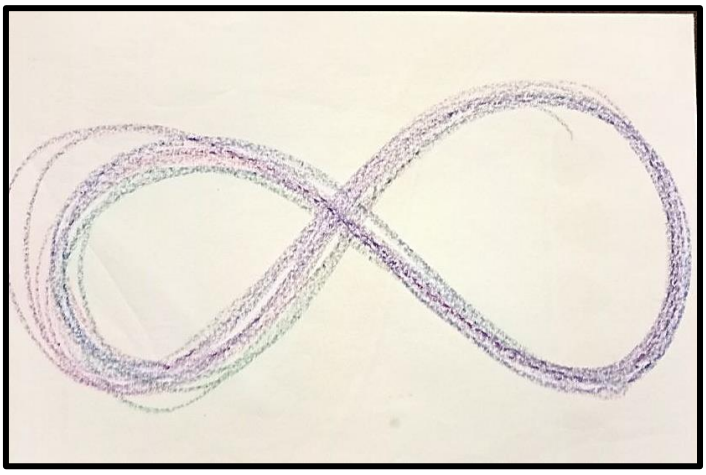
3.9.5 Midline crossing

The midline is the imaginary vertical line that divides the body into two symmetrical halves (De Witt, 2016:100; Grové & Hauptfleisch, 1992:131). Krog (2020:330) claims that learners who are not able to cross their midline, might experience difficulties with reading from left to right, writing from left to right across a page, and use scissors, and they might even switch the writing utensil to the other hand when reaching the middle of the page. Therefore, learners must be able to cross the midline to write from the left-hand side of the page through to the right-hand side of the page.

Three activities were included in the pre-handwriting programme to promote midline crossing:

- The first activity is known as the "lazy 8". It is a popular exercise in midline crossing. Here the learners can "write" the shape in the air, using their fingers, do it on a blackboard, or with wax crayon on paper (Joubert, 2019:204) (see photograph 3.3).
- The second activity requires puzzles, and in the pre-handwriting programme, an example appears of a simple puzzle that can be made by using ice-cream sticks and a magazine picture.

- The last of these activities show a pegboard that can easily be made by the teachers. Pegboards were, however, not a prerequisite for the implementation of the pre-handwriting programme, although some of the participating schools were equipped by the DBE with commercially available pegboards. The pegboard activity was included in the programme to show the teachers the value of a pegboard in the development of pre-handwriting skills.



Photograph 4.3: The page that was used to demonstrate the "lazy 8" activity to the teachers, as recommended by Joubert (2019:204)

3.9.6 Directionality

Directionality is an awareness of the space around the learner and develops once the learner has an established awareness of laterality, which is the understanding that the body has a left and a right side (Africa & Van Deventer, 2016:1961). Directionality makes use of prepositions, such as top, bottom, under, over, left, right, next to, et cetera, and therefore is the basis of handwriting, as it allows for the understanding of letter formation and the direction letters should face (Africa & Van Deventer, 2016:1961; Grové & Hauptfleisch, 1992:131).

- The first activity in the pre-handwriting programme that promotes directionality entailed the use of the bottle tops included in the pre-handwriting pack, or the counting cubes, in sets of the colours as provided to the schools.
- The second activity involved the use of pegboards. Again, pegboards were not a prerequisite for the implementation of the pre-handwriting programme, but they were included to show the use of pegboards for schools that had been equipped by the DBE with pegboards.

- The third and fourth activities only required learners' use of their bodies as they worked in pairs.

3.9.7 Position in space

Position in space allows the learner to identify objects as being above, below, underneath, et cetera (De Witt, 2016:99; Grové & Hauptfleisch, 1992:131). These concepts are important in handwriting, as they allow for the placement of letters on a page.

- The first activity in this exercise involved the learner and the desk chair as the learner follows the instructions given by the teacher, for example, "stand behind your chair".
- The second activity entailed the use of the coloured counting cubes or the bottle tops in an extended version of the activity used for directionality (see § 0) by including spatial concepts, such as "on top of" and "underneath".
- The third activity involved using the learners' drinking cups and face cloths. The schools in Mankweng require each learner to bring their own cup and face cloth to school because these schools have feeding schemes. The learners receive juice in their own cups and wipe their mouths and clean their eating area with their face cloths after eating. Instructions using these materials would be, for example, "put your face cloth inside your cup, put your cup on top of your face cloth", et cetera.

3.9.8 Muscle tone

Learners with low muscle tone have muscles that seem less firm, and these learners seem to have loose joints. This makes it difficult for them to maintain a good sitting posture while performing writing tasks, and they present with inadequate endurance and a lack of physical strength (Ganguly et al. 2021:1; Randjelović *et al.*, 2018:617). The activities for improved muscle tone in the pre-handwriting manual included photographs of a 5-year-old learner performing the tasks.

- The first activity was the chair push-up where each learner used a desk chair and attempted to lift themselves off the chair.
- The second activity involved only the learner's body – making a bridge by lifting their backs off the floor.
- In the third activity, the learners laid on their stomachs and lifted their hands and feet simultaneously to form the superhero pose.

3.9.9 Fine motor coordination

Fine motor skills entail the use of the smaller muscles in the hands for tasks that require precise movements and coordination, such as drawing, writing, and cutting with scissors (Randjelović *et al.*, 2018:616). Learners' fine motor skills must be well developed for the task of handwriting in order to write legibly (Randjelović *et al*., 2018:618).

- The first activity in the pre-handwriting programme involved magazine paper, newsprint paper, or a sheet of used paper. The learners had to crumple the paper into a small ball in one hand at a time without using the other hand.
- The second activity extended the first activity to crumpling paper in each hand simultaneously.
- The paper balls formed in the first two activities could be used in the next activity that promoted hand–eye co-ordination by target throwing the paper balls into the wastepaper basket in the classroom.
- The three activities listed under "Pencil grip" (§ 0) are also excellent fine motor coordination exercises.

3.9.10 Hand–eye coordination

Another word for hand–eye coordination in terms of handwriting is *graphomotorics*. This is the ability to interpret information received from the eyes to steer the hands in the execution of tasks such as handwriting (Randjelović *et al*., 2018: 612):

- The first activity showed how a racquet could be made using a wire coat hanger and a pair of stockings. The researcher had such a racquet at hand to show the teachers. The Grade 1 teachers were not expected to make the racquets for the implementation of this programme. The learners could use their hands as racquets to hit the crumpled paper balls made in the fine motor coordination exercise (§ 0), to bounce the paper balls on one hand, or to hit the paper balls to a friend.
- The second activity showed that the crumpled paper ball could be tossed into the air as high as possible, and the learner had to catch it again.
- The third activity was demonstrated to the Grade 1 teachers as a possible art project in the classroom. The learners could paste a picture from a magazine (or a self-drawn picture) in the middle of a cardboard square. The teacher would punch holes around the edges of the cardboard square and provide the learners with a length of wool to thread through the holes. This would form a frame around the picture.

3.9.11 Visual discrimination

Visual discrimination allows learners to recognise the different letters of the alphabet; it allows for the recall of what a letter looks like and enables learners to discriminate between two letters that might look very similar, for example, “b” and “d” (Loubser, 2015: 67):

- The first activity required the teacher to write a mixed collection (in straight lines) of b, d, p, and q on the board. The learners would have to read each letter in turn at increasing speed with each repetition of the activity.
- The second activity required the teacher to write word families (consonant, vowel, consonant combinations) on the board, for example, hat, cat, mat, sat, rat, and bat. Visual discrimination would lead the learners to notice that the initial consonant differs in each word.

3.9.12 Balance

Balance in terms of handwriting concerns postural control. The ability to maintain static balance allows for good postural control while writing (Loubser as cited in Excell & Linington, 2015:61). Maintaining balance aids perceptual motor skills such as midline crossing and laterality (Loubser as cited in Excell & Linington, 2015:61). Both static and dynamic balance activities were provided in the pre-handwriting programme:

- In the first activity, the learners had to walk across a balance beam.
- The second activity required the learners to hop and to hop while running, alternating legs.
- In the third activity, the learners had to stand on each foot alternately for 10 seconds, followed by standing on each foot alternately for five seconds, with their eyes closed.
- In the fourth activity, the learners had to hop 10 steps forward on one foot, switch feet and hop a further 10 steps, repeating this sequence until the end spot indicated by the teacher.
- Activity 5 required a long chalk line, or a length of rope, with the learners walking on the line, followed by walking heel–toe on the line.
- Activity 6 encouraged leg stands. In this activity, the learner stands on one leg, bends the body at the waist, and picks up an object from the floor. This had to be repeated five times, alternating legs.

3.9.13 Pencil grip

The exercises for pencil grip are aimed at finger strength in order to maintain pencil grip. The customary pencil grip is the tripod grip (Odokuma & Ojigho, 2019:122; Schwellnus *et al*., 2012:719). In the tripod grip, the pencil is manoeuvred with three fingers: the thumb; the index finger; and the middle finger because it allows the fingers to bend and extend while writing (Kandil *et al.*, 2016:10; Guven & Uysal, 2022:6). The thumb pad applies pressure to the pencil, the index finger guides the pencil, and the middle finger supports the pencil. For optimal control, the pencil should be held 2,5 cm from the pencil point (Sisada, 2016:38). The dynamic tripod grip was demonstrated to the Grade 1 teachers, and it was explained that the same grip should be used by left-handed learners (see figure 2.4). Teachers and OTs often use rhymes and short stories to encourage the use of the dynamic tripod grip. One such rhyme was included in the pre-handwriting programme. Three activities were included under pencil grip:

- Activity 1: Picking up of small objects using the tips of the thumb and index finger.
- Activity 2: Rolling small balls from play dough using the pads of the thumb, index finger and middle finger.
- Activity 3: Attaching clothes pegs to the edge of a shoe box using the pads of the thumb, index finger and middle finger. The learners should remove the clothes pegs again, and the clothes pegs are easily stored inside the shoe box.

3.9.14 Writing tools

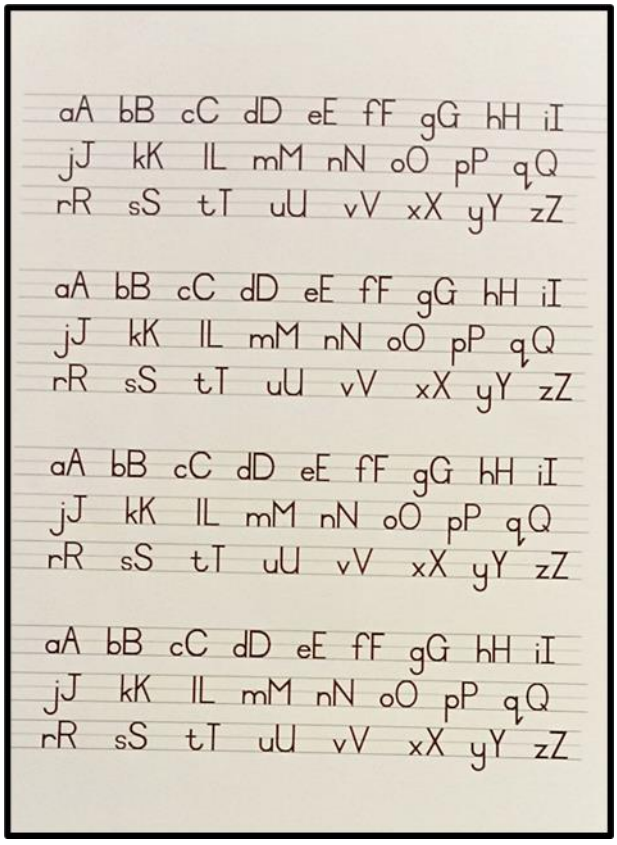
A brief discussion was held on the writing tools to be used in preparing the learner for formal handwriting instruction. Teachers and OTs hold different viewpoints on preferred writing tools, and these were mentioned in this section of the pre-handwriting programme.

3.9.15 Letter formation

Teachers are encouraged to make media, such as sand and flour, available for learners to write in so that learners familiarise themselves with the correct formation of the letter before writing in their books. Teachers often use simple stories and rhymes in teaching letter formation. This was discussed with the teachers during the activity demonstrations.

3.9.16 Desk handwriting chart

A chart of the letters of the alphabet in both lower- and upper case was included – four sets per A4 sheet of paper. The need for this was indicated in the questionnaires completed by the Grade 1 teachers. The charts could be attached to learners' desks to serve as reminders of correct letter formation and how the written letter should appear in lines (see photograph 3.4).



Photograph 4.4: The desk charts included in the pre-handwriting programme. Four sets per A4 page to make photocopying economical.

3.10 FOCUS GROUP DISCUSSIONS

The final opportunity to collect data was during the focus group discussions. The first focus group consisted of eight teachers from four different schools. The following two focus groups were held at specific schools and consisted of eight teachers from two schools, respectively. Field notes were taken and served as additional evidence. The focus group discussions were transcribed verbatim and thematically analysed. The findings are discussed in chapter 5. During the focus group discussions, the Grade 1 teachers were encouraged to relate their

experiences of the implementation of the pre-handwriting programme. Unfortunately, it should be noted that the groups were not very cooperative in terms of the implementation of the programme, and they blamed this on the COVID-19 pandemic. Therefore, only limited contributions could be made in the focus group discussions. However, three of the teachers brought learners' workbooks to serve as evidence and photographs of the progress in learners' written work.

3.11 DATA ANALYSIS AND INTERPRETATION

Creswell and Creswell (2018:181) posit that qualitative researchers use multiple forms of open-ended data, such as texts (documents, field notes, questionnaires) and audio-visual information. In this study, audio-recordings were made as opposed to audio-visual recordings. The data obtained from this study were varied: questionnaires; photographic evidence of learners' written work; observation checklists; audio-recordings from the focus group discussions, which were transcribed; and field notes. Thematic analysis, as proposed by Braun and Clarke (2022:14), was used to identify recurring themes, and persistent themes were coded as significant.

3.11.1 Thematic analysis

Thematic analysis (TA) is widely practised as a qualitative approach in data analysis (Braun & Clarke, 2022:1). Unlike grounded theory and narrative analysis that have been labelled as ready-made methodologies because they drive certain types of research questions, TA requires conceptual thinking from the researcher (Braun & Clarke, 2022:1). McLeod (2015:147) applauds the use of TA as the best tool for analysis for assertive researchers who have a clear vision of the desired outcomes. King and Brooks (2017:220) describe themes as "fossils hidden in a rock", meaning that themes dwell in the data, waiting for the researcher to uncover them. However, Braun and Clarke (2022:3) acknowledge that assumptions may influence tractability in coding and the emergence of themes.

The coding was done manually because the dataset was manageable (16 participants). The themes and findings are discussed at length in chapter 4. All data collected by the various methods were thematically analysed. The questionnaires and classroom observation checklists were read and re-read, and themes were identified. This, along with the focus group transcripts, formed the bulk of the collected data. Additional collection methods –

namely field notes and photographic evidence – provided a secondary information source that added value to the primary data. All thematic analysis procedures were assisted by co-coders, namely the research supervisor and the co-supervisor.

3.12 OBSTACLES DURING DATA COLLECTION

3.12.1 The COVID-19 pandemic

The pandemic had an impact on data collection as documented in the COVID-19 protocol sheet (see Annexure L).

3.13 ETHICAL CONSIDERATIONS

3.13.1 Ethical clearance

After satisfying the requirements of the Research Ethics Office and providing evidence of an approved research proposal, the researcher obtained ethical clearance from the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Office (NWU-EMELTEN-REC). The ethics number allocated to this study (in March 2021) is NWU-02054-20-A2 (see Annexure G). This ethical clearance certificate was revised in September 2021 to accommodate two more focus group discussions.

3.13.2 Consent

The DoE in Limpopo does not facilitate an ethics committee; therefore, the researcher was compelled to submit a request to the Office of the Premier, in addition to the DoE, to conduct the study in public schools. Permission was granted under number LPREC/29/2021: PG (see Annexure H).

3.13.3 Gatekeeper

The gatekeeper for this study, a retired phase specialist and trusted community member, who had been employed in Mankweng schools for many years, was instrumental in the dealings with the schools. The gatekeeper signed a confidentiality agreement form with NWU (see Annexure I).

3.13.4 School principals and school governing bodies

The gatekeeper accompanied the researcher to the schools by appointment with the school principals. The letters of permission addressed to the SGBs were handed to the school principals. The chairperson of each SGB had the opportunity to contact the study supervisor, Dr Preston, with any queries about the study. No such queries were received.

3.13.5 Grade 1 teachers

Owing to the COVID-19 pandemic, the school principals requested that the gatekeeper and the researcher address the Grade 1 teachers on the same day. The consent forms and questionnaires were distributed to the teachers, explaining what the study would entail and that their participation would be voluntary, with the right to opt out at any time during the study. Confidentiality and anonymity were explained to the teachers. The teachers were given the opportunity to ask questions in English and Sepedi. The teachers had time to peruse the letters of consent for a period of two weeks, and the signed letters were collected when the researcher visited the teachers' classrooms to observe the handwriting lessons.

3.13.6 Grade 1 learners and their parents/guardians

Letters informing the parents of the Grade 1 learners of the study and how their children would benefit from participating in the study were handed to the schools for distribution on the day the gatekeeper and the researcher visited the school principals (see Annexure E). No parents at any of the six schools indicated that they would prefer their children to be excluded from the study. The letters of consent were distributed and received by the Grade 1 teachers. Before each teacher started presenting the handwriting lesson, the learners were asked to assent to the presence of the researcher by means of a thumbs-up or thumbs-down as per an A4-size poster (see Annexure F). Fortunately, no learners objected; rather, they were excited to have someone from "the university" visiting their classroom.

3.13.7 Privacy, confidentiality, and anonymity

The researcher respected the Grade 1 teachers' privacy by not creating a group chat on a social media platform and by not sharing participants' contact details with other participants. For the sake of anonymity, each school was renamed as a letter of the alphabet. These letters had to be clearly audible and distinguishable when speaking from behind a COVID-19-compliant cloth mask during the focus group discussions. The chosen letters were G, J,

L, W, X and Y, because they are not easily confused auditorily. The teachers were assigned numbers according to their school, for example, G1, G2, J1, J2, et cetera.

During the focus group discussions, the participants were reminded to treat shared information as confidential. Nonetheless, no sensitive personal information was shared, as the participants only reflected on the activities of the pre-handwriting programme and asked advice on supporting learners, for example, left-handed learners, during handwriting instruction.

Photographic evidence was gathered of the learners' work in their books at the end of the handwriting lesson observation sessions at each school. Photographs were also taken of learners' pencil grasps while they were writing. These digital photographs were shown to the teachers before leaving the classroom to assure them that photographs of only the workbooks and learners' hands had been taken and not of the learners' faces. Also, the learners' names do not appear on the photographs. Thus, none of the photographic evidence can be linked to any specific learner or the school where the photographs were taken.

3.14 TRUSTWORTHINESS

Four measures were taken in this study to ensure trustworthiness, as recommended by Lincoln and Guba (1985:14), Merriam and Tisdell (2016:239), and Stahl and King (2020:26). Trustworthiness (§ 1.11) was ensured as follows (see § 3.14.1–3.14.4 below).

3.14.1 Credibility

Member checking was used to test the credibility of the transcriptions of the focus group discussions. Two members from each focus group were asked to read the verbatim transcriptions and declare it a true reflection of the discussions (see table 2, § 1.11).

3.14.2 Transferability

This study has been described systematically so that the study can be duplicated, as mentioned in table 1.2 (§ 1.11). Applicable findings should be transferable to other contexts.

3.14.3 Dependability

Detailed descriptions of the methods employed in this study are provided in this thesis, as mentioned in table 1.2 (§ 1.11). The findings of the study will be stored for five years.

3.14.4 Confirmability

The findings have been cautiously linked to the data, without bias, or personal interest or opinions of the researcher. The researcher can confirm that this thesis is an objective recollection of the actual events and data collected, as per table 1.2 (§ 1.11).

3.15 SUMMARY

In this chapter, the research design, theoretical framework, paradigm and methodology were elucidated. The sampling strategy, data collection process and the impediments during data collection were explained. Furthermore, the method of data analysis and interpretation were described. Ethical considerations were adhered to in the study, and evidence of this was included in this chapter. The findings are discussed in the next chapter.

CHAPTER 4: ANALYSIS OF DATA AND INTERPRETATION

4.1 INTRODUCTION

Following a discussion of the research methodology in the previous chapter, this chapter aims to provide an overview of the results of this study and a thematic analysis of the qualitative data. The data were collected by means of questionnaires, observation sheets, focus group interviews, field notes, and evidence of learners' written work. In this chapter, the findings are discussed and corroborated with existing literature.

4.2 METHOD OF DATA ANALYSIS

Clarke and Braun (2018:107) state that their thematic approach is becoming increasingly popular, probably because of their uncomplicated approach to data analysis. The use of the thematic approach in this study is explained in § 1.10 and 0. Kiger & Varpio (2020:4-5) table the six steps in thematic analysis, as suggested by Braun & Clarke (2006). These steps were applied in this study for data analysis and interpretation:

- Step 1: The researcher familiarises themselves with the data
- Step 2: The generation of initial codes
- Step 3: The researcher searches for themes
- Step 4: The themes are reviewed
- Step 5: Themes are defined and named
- Step 6: The final report or manuscript is produced.

It must be noted that all the data that emerged from the various data collection methods were thematically analysed, and themes were identified. These themes were triangulated. Triangulation is described as the convergence of different data sources to establish a clear, comprehensible explanation in order to validate the study (Creswell & Creswell, 2018:200). In this study, the questionnaires, classroom observation checklists, field notes, photographic evidence and the transcripts (focus group discussions) were used in the process of triangulation. Triangulation provided the researcher with a rich, in-depth view of the results of the implemented pre-handwriting programme.

4.3 DATA ANALYSIS OF THE VARIOUS DATA COLLECTION METHODS AND INTERPRETATION

4.3.1 Introduction to the data collection methods

For this study, there were three main data collection methods, namely questionnaires, observation checklists with field notes, and focus group interviews. Throughout the data collection process, evidence of learners' written work was also collected. Braun and Clarke (2019:14) explain that the researcher has an active role to fulfil in the construction of knowledge and, as such, thematic analysis signifies the researcher's understanding of patterns and themes in the data. Braun and Clarke (2019:14) state that themes are tales interpreted from the data, which are created when the researcher's theoretical suppositions overlap with investigative skill and datasets. Thus, the datasets in this study from all the different data collection methods were thematically analysed for the authentic tale of this study to be authored.

The next section provides an overview of the themes and subthemes that were identified in the data, as depicted in figure 4.1. A final comparison is made of the various themes obtained from all the data sources, and a final comment is then expressed. This is reflected upon in depth in chapter 5.

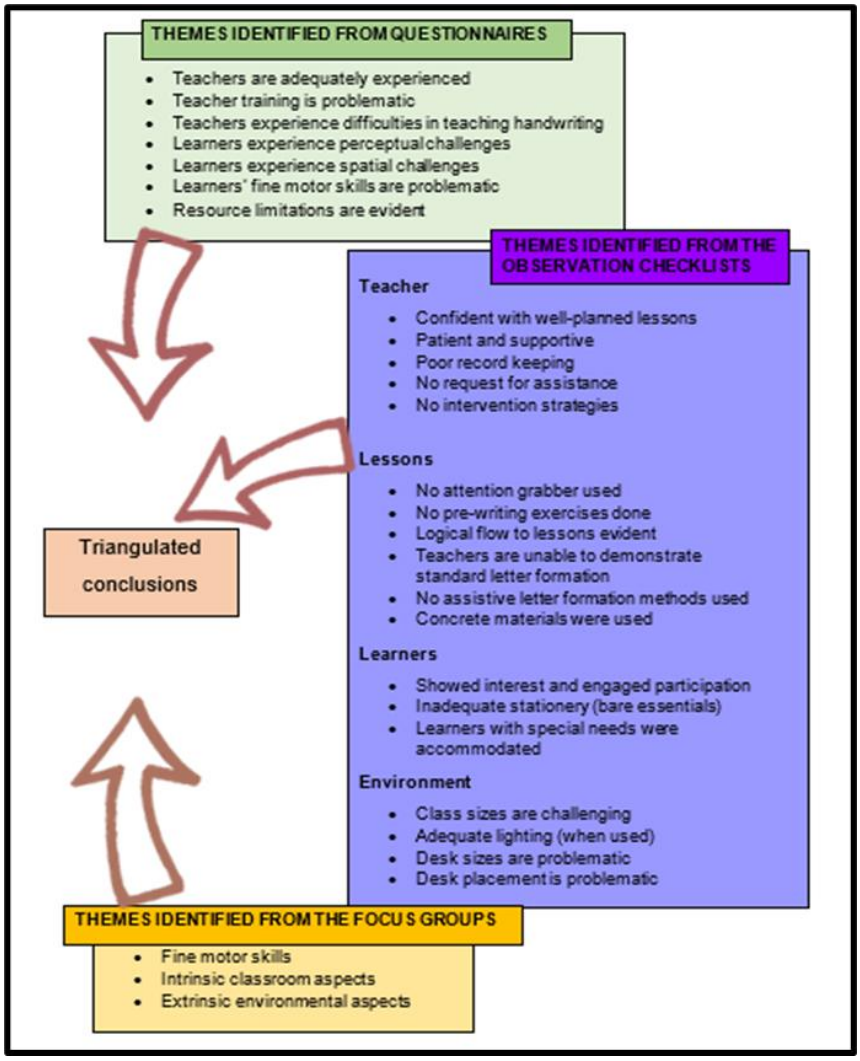


Figure 5.1: A reflection of the various data collection methods and interpretation

4.3.2 Questionnaires

The questionnaire was carefully designed, following Maree and Pietersen's (2019:200) recommendations, with well-defined questions. The questionnaire started with factual questions, for example, *Are you a qualified Foundation Phase teacher?* and *How long have you been teaching in the Foundation Phase?* The questions then moved to open-ended questions, such as *What is your view on teaching handwriting?* The questionnaires provided insight into the teaching and learning environment, the teachers' view on handwriting, and how handwriting was taught at Grade 1 level in the six schools in the suburban area of Mankweng. Figure 4.2 shows that valuable insights were generated by the questionnaires.

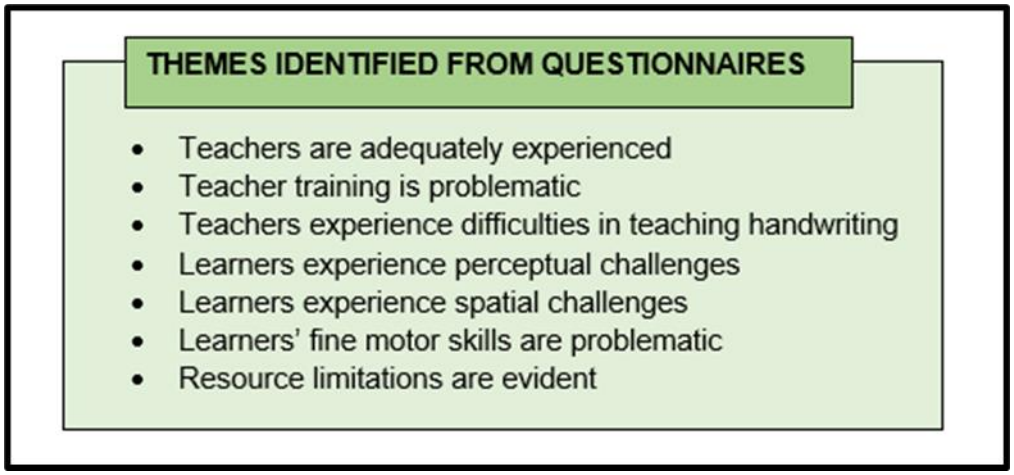


Figure 5.2: An illustration of the identified themes from the questionnaires

It would have been possible for the teachers to complete the questionnaire within 60 minutes, but due to the COVID-19 pandemic conditions, the questionnaires were left in the teachers' possession and collected on the day of the classroom observations. The following section discusses findings that emerged from the questionnaires (see § 1.9.1 and Annexure J).

4.3.2.1Results and analysis of the data that emerged from the questionnaires

Questions 1 to 3

The aim of questions 1 to 3 was to establish the experiences of the participants, not only in the Foundation Phase in general, but also in the actual teaching of Grade 1 learners regarding handwriting instruction. According to the CAPS document, handwriting is taught formally in Grade 1 (DBE, 2011a:19).

Question 1: *Are you a qualified Foundation Phase teacher?*

Of the 16 participants, 12 were qualified Foundation Phase teachers; the remaining four teachers held Senior Phase qualifications. Thus, the teachers qualified to teach in the Foundation Phase constituted 75% of the participants (see figure 4.3). Of the four teachers who were qualified to teach in the Senior Phase, two participants indicated that they were only temporarily appointed in the Foundation Phase while the school awaited the appointment of two qualified Foundation Phase teachers. The remaining two Senior Phase teachers indicated that they expected to remain in the Foundation Phase indefinitely.

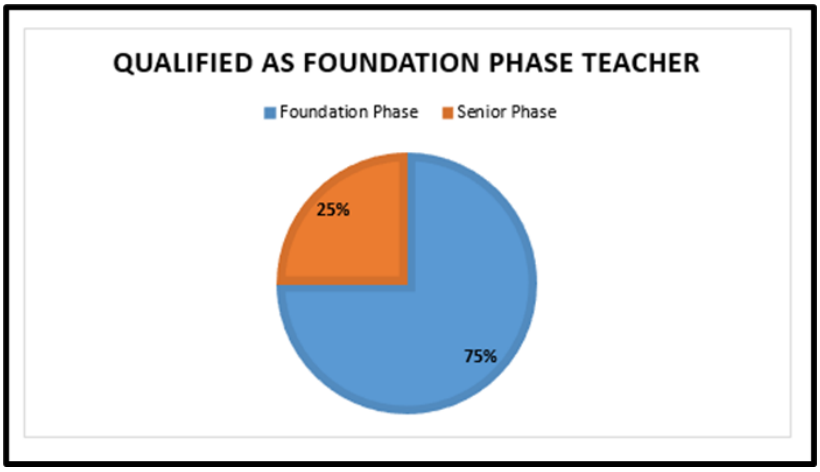


Figure 5.3: Teachers qualified as Foundation Phase teachers

Question 2: *How long have you been teaching in the Foundation Phase?*

Gatbonton (2008:162) defines experienced teachers as teachers who have at least three years' experience in the classroom. In this study, 18% of the 16 participant Grade 1 teachers would thus be considered inexperienced teachers, according to Gatbonton's definition. The years' experience that teachers had ranged from one to three years (three of the teachers), four to six years (six of the teachers), and seven plus years (seven of the teachers) (see figure 4.4). The teacher with the least experience had been teaching for less than one month. The teacher with the most experience had been teaching in the Foundation Phase for 37 years. Therefore, 13 teachers in this study would be considered experienced teachers, and three would be regarded as inexperienced.

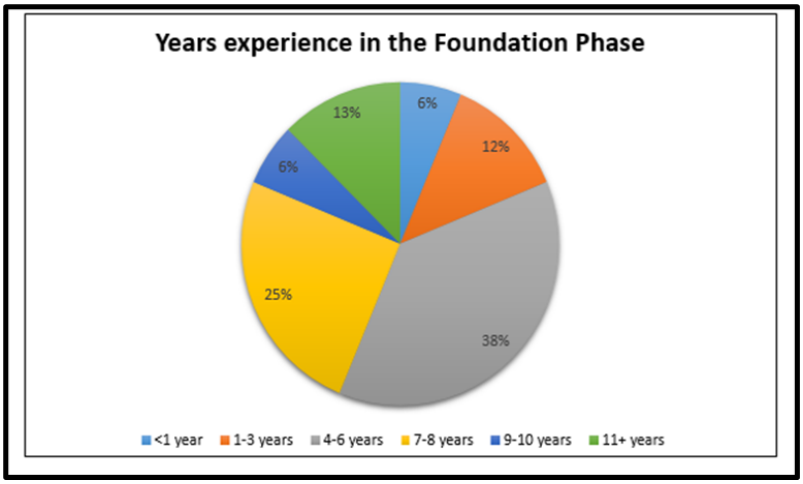


Figure 5.4: The 16 Grade 1 teachers' number of years' experience in the Foundation Phase

Question 3: *How long have you been teaching Grade 1*?

This question was posed to establish the teachers' familiarity with teaching handwriting in Grade 1, as the teaching of handwriting forms part of the Grade 1 teacher's daily tasks. In addition, it is only in Grade 1 that the young learner engages in formal handwriting instruction for the first time because, according to CAPS, handwriting is not taught in Grade R (DBE, 2011a:30). This highlights the crucial nature of the specific knowledge and experience of standard handwriting methods that are essential to the Grade 1 teacher. Question 3 was, therefore, posed in the light of Loubser *et al.*'s (2016:55) concern that should early childhood teachers have insufficient training or poor pedagogical knowledge, they would not be able to establish an environment conducive to optimal learning.

Figure 4.5 below shows that Teachers 8, 10, 11, 14 and 15 (considered experienced teachers in the Foundation Phase) clearly revealed less experience in teaching Grade 1. It should be noted that, according to CAPS, Grade 2 learners transition to a "joined script" or cursive writing and continue with the joined script writing style in Grade 3, hence the emphasis on the teacher's experience of teaching standard print handwriting in Grade 1 (DBE, 2011a:29).

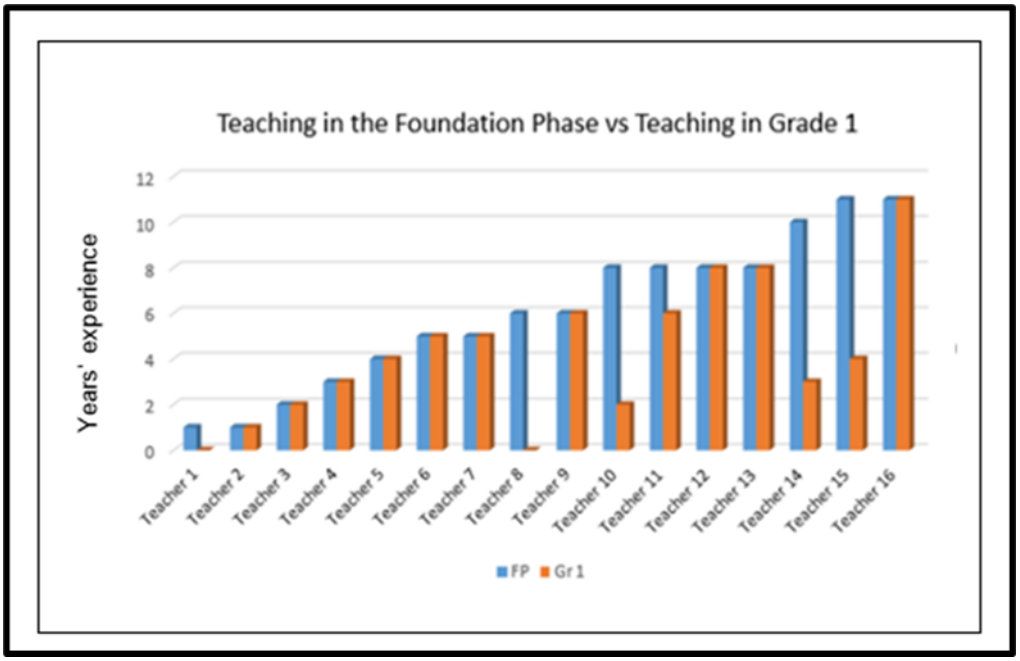


Figure 5.5: Participant teachers' experience of teaching in the Foundation Phase versus teaching Grade 1

Question 4: *What is your view on teaching handwriting? (Do you see it as an important*

part of learning, is it easy to teach handwriting, and should handwriting be taught formally in Grade 1? Etc.)

Question 4 was put to the teachers to obtain their views on the teaching of handwriting. The CAPS document states that before teaching handwriting to Grade 1 learners, a pre-writing programme should be followed "to develop visual discrimination, gross and fine motor and hand-eye coordination, body image, etc." (DBE, 2011b:19). However, this does not seem to be happening in sub-rural Grade 1 classrooms, and it underscores the need for a pre-handwriting programme. This question was directed at the unique views of the participants to obtain their responses regarding what was occurring at the grassroots level in the classroom, how important they considered this aspect of learning, and to provide insight into their own challenges regarding the teaching of handwriting.

Generally, all the teachers agreed that they deemed handwriting as an important part of learning and that handwriting should be taught formally in Grade 1. However, five teachers responded that it was difficult to teach handwriting, as they had not been trained to teach handwriting to young learners. For example, X3 responded "*[i]t is difficult to teach handwriting in Grade 1, but it is necessary*", and W2 added "*[i]t is an important part of learning. However, it is not that easy to teach it in the lower grades such as Grade 1*".

W3 said "*[i]t is difficult to teach handwriting. Even I myself, I don't know if I'm doing it right, 'cause I was not trained to teach handwriting*". G3 further highlighted the latter, saying "*[w]e never trained to teach handwriting*". A further challenge was noted: "*No, it is not easy to teach handwriting, because some learners don't understand well, some are slow to learn*" (X2). This compounded the situation, as some of the learners struggled to comprehend the execution of writing tasks. These five responses were from teachers who were deemed experienced teachers with at least four years' experience in teaching Grade 1. On reflection, perhaps the response from G1 summarises the evaluation of the responses: "*It is important. Learners need to know how to write letters. It is not so difficult [to teach handwriting], but workshops need to be done to remind educators how to teach it*."

Responses from the remaining three teachers clearly indicate that no pre-handwriting programme had been followed before introducing formal handwriting instruction as prescribed by CAPS (DBE, 2011b:19):

X1: "*It is important to teach handwriting in Grade 1, but it is not easy. Learners does not*

know how to hold a pencil."

W1: "*I see teaching handwriting as an important part of learning because it strengthens fine motor muscles of the learners, correct pencil grip.*"

G2: "*It is good because it prepares learners to write in between lines*."

The responses from X1 and W1 are indications that a pre-handwriting programme had not been followed, resulting in the learners lacking the fine motor muscle strength to facilitate the dynamic tripod grip necessary for effective execution of writing. The response from G2 is another indication that a pre-handwriting programme had not been followed because of the lack of development of spatial orientation, or spatial awareness, which is necessary for learners to be able to write between lines (Krog, 2020:331). It is the researcher's understanding that fine motor muscles should be developed and strengthened in preparation for the dynamic tripod pencil grip, understood by the teachers as "the correct pencil grip" (Lin *et al.,* 2017:378; Odokuma & Ojigho, 2022:122; Sisada, 2016:40).

Responses such as those of W1, X1 and G2 could be indicative of teachers who were not well trained in teaching handwriting, just as W3 and G3 indicated that they had not been trained in teaching handwriting. It is also understandable that a teacher who is qualified as a Senior Phase teacher and has never had to teach handwriting would find it difficult to teach handwriting to Grade 1 learners.

Lack of preparedness of inadequately trained Grade 1 teachers and Senior Phase teachers teaching in Grade 1 could have a negative impact on teachers' confidence in teaching. In addition to a lack of pedagogical knowledge to teach handwriting, should the teacher employ fewer effective methods of handwriting instruction, it could have a lasting negative effect on learners' handwriting skills.

Questions 5 to 7

These questions aimed to identify the difficulties the teachers experienced when teaching handwriting to Grade 1 learners. Many of these difficulties were often experienced by other Grade 1 learners; therefore, one should not see this as an exception (Annandale, 2019:42). Furthermore, these questions also explored how the participating teachers addressed these difficulties.

Question 5: *Name the difficulties you experience as a teacher in teaching handwriting at the Grade 1 level.*

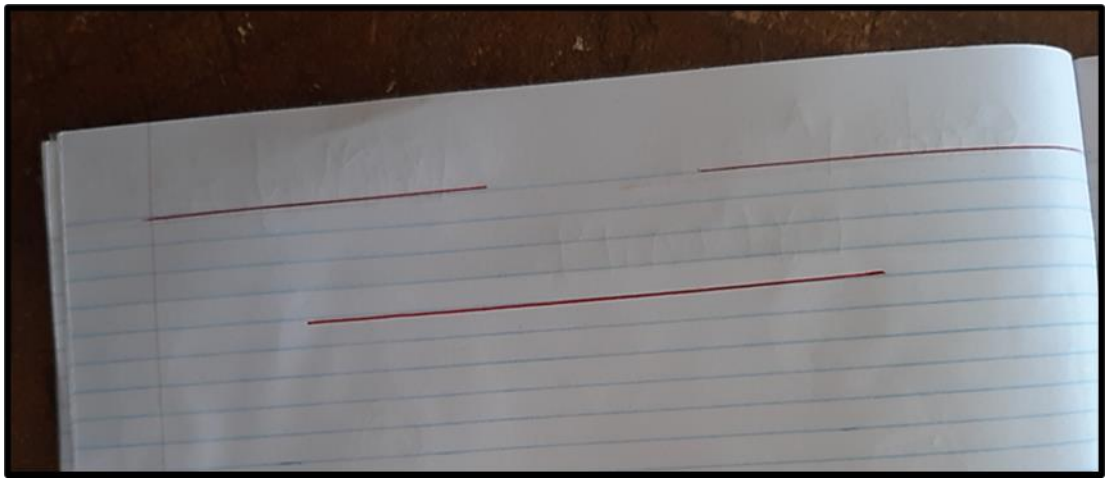
This question pertinently requested information on the participants' personal views on the difficulties that they experienced when teaching handwriting at the Grade 1 level. The teachers' responses to this question reflected challenges regarding the lack of resources, more than the actual teaching. What the teachers understood as "difficulties" were indicated as a shortage of stationery for learners, including a lack of the most basic items such as small chalkboards, chalk, pencils, and erasers. Resource challenges were indicated by participants W1 and L3:

W1: "*The difficulties that I have experienced is the lack of other resources, materials to teach handwriting such as individual blackboards for the learners with chalk*."

L3: "*Learners have no books, charts and materials*."

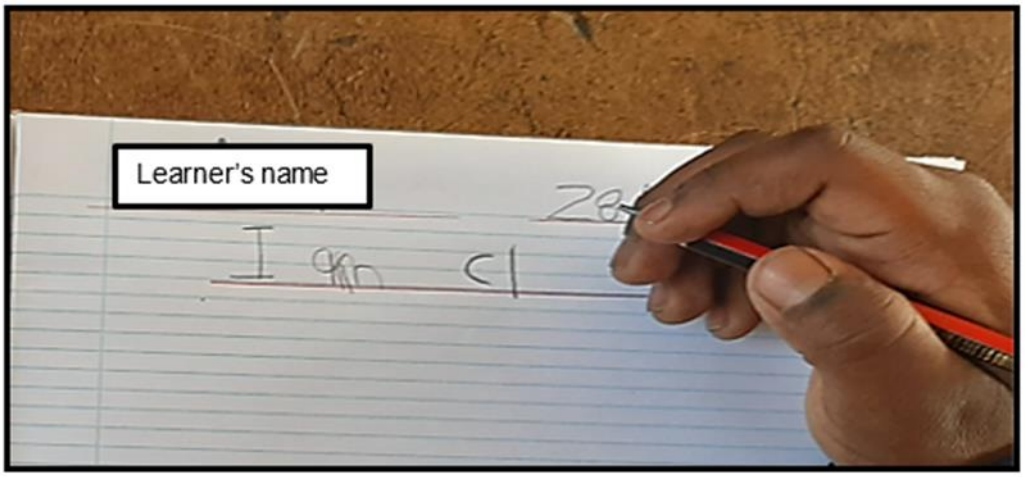
The situation thus culminated in challenges regarding the teachers not being able to, for instance, mark the lines for the learners indicating where they must start to write. Many may say that these challenges seem like excuses and give the impression that they are rather insignificant and can be easily overcome. When considering that these schools are sub-rural institutions, the reality of the limitations of resources presents an immense problem for the teachers. It should be borne in mind that these communities are extremely restricted as far as finances are concerned. All the participating schools are Quintile 3, "*no-fee*" schools due to the level of poverty in the area. South African schools classified as Quintile 3 are wholly subsidised by the DoE, as parents are not required to pay school fees. These schools may experience a shortage in resources due to financial constraints.[11] To illustrate the extreme effect of the lack of a "small" resource such as a red pen, the following photographs can be considered. Photograph 4.1a shows how some of the teachers marked the lines for the learners to show where they had to begin to write.

[11] http://section27.org.za/wp-content/uploads/2017/02/Chapter-7.pdf



Photograph 5.1a: Red lines drawn by the teacher

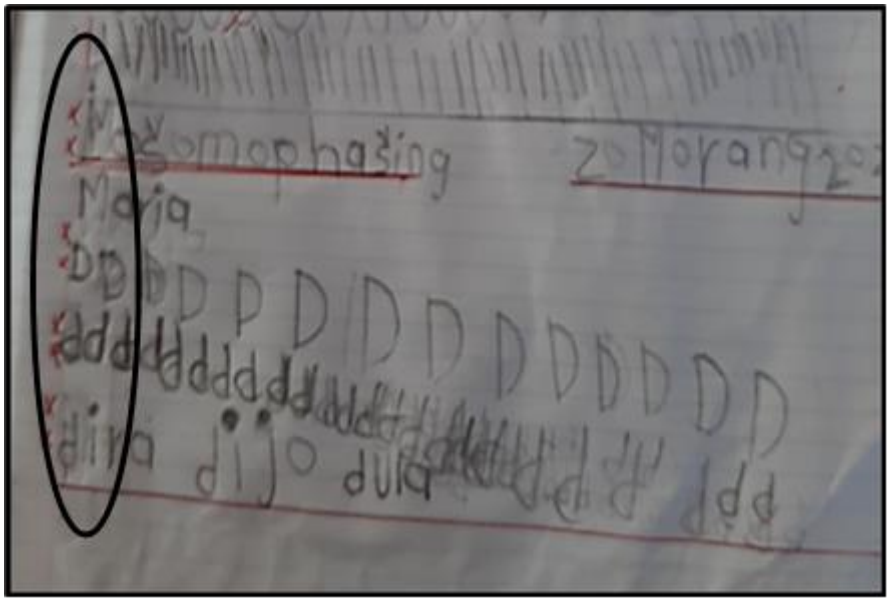
Photograph 4.1b shows a learner making use of the marked lines to write the date, the day of the week and the heading for the day's work. This simple example illustrates the importance of having adequate resources to teach, as the learner quickly learns from using this method, facilitating the teaching and learning process (see photograph 4.1b). Therefore, just being able to mark two writing lines, learners can be guided in the right direction when teaching handwriting. However, at times, even with the marking of the lines, learners still seemed to struggle and encounter serious handwriting problems (see photograph 4.1b below). With these learners, writing with no guiding lines would lead to even more confusion; it is indicative of an underdeveloped sense of spatial awareness (De Witt, 2016:99; Krog, 2020:331).



Photograph 5.1b: Learner writing on the lines drawn by the teacher

Question 6: *Name difficulties experienced most often by Grade 1 learners in handwriting.*

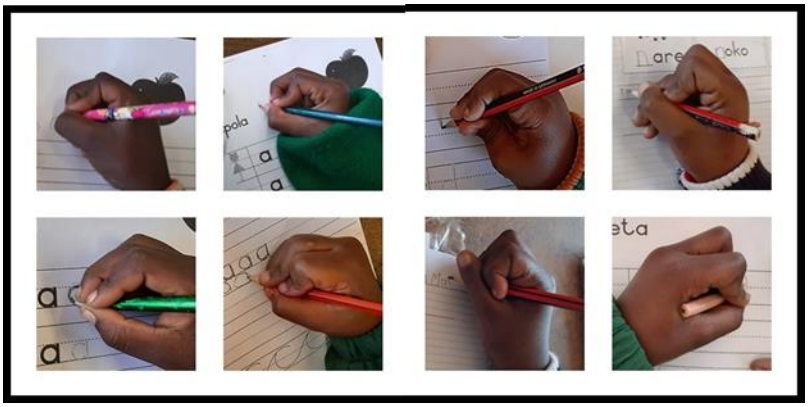
This question was posed to elicit the teachers' personal responses regarding their experiences and challenges when teaching handwriting. The most-often mentioned difficulties were pencil grip and positioning of the book, as shown in photograph 4.3 below. In these situations, learners display a variety of ineffective pencil grips. From photograph 4.2, it is also evident that the book is not always positioned at an angle (as described in § 2.5.4) to afford the learner a clear view of where writing is taking place. This is especially noticeable in left-handed writers where the written work is masked completely from the writer's view.



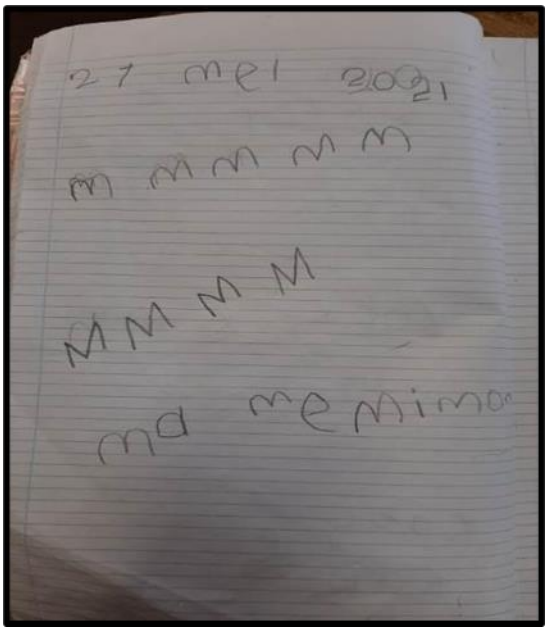
Photograph 5.2: Marking two of the writing lines to guide the learners in letter formation

A difficulty highlighted by teachers was that learners did not know where to start writing, as can be seen in photograph 4.4a. The learners wrote anywhere on the page, even with guidance from the teacher. Confusion of lower-case letters in relation to upper-case letters showed up as another difficulty for the Grade 1 teachers, as shown in photograph 4.4b. In photograph 4.5a, the learner wrote the lower-case "g" over the same lines as the capital letter G. This results in the words appearing on different planes when writing the words "*gauta*" (gold), "*gare*" (in the middle) and "*gana*" (refuse/not wanting to do something), because the learner seems unable to position the "a" on the same baseline as the "g". Photograph 4.5b shows the learner writing the capital letter "I" over two lines and matching

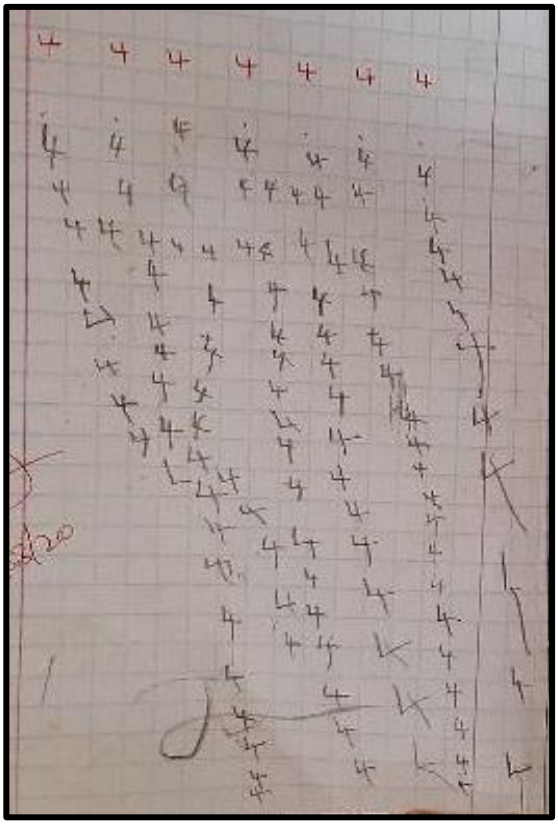
the size of the capital letter when writing the lower-case “i”. Furthermore, dotting the “i” in the line above the capital letter also increased the confusion. In photograph 4.5c, the learner was writing the capital “E” over five lines instead of two. Yet, the lower-case “e” appeared in a single line, as it should be written. The learner seemed unable to use the size of the lower case “e” to gauge the size of the capital “E”.



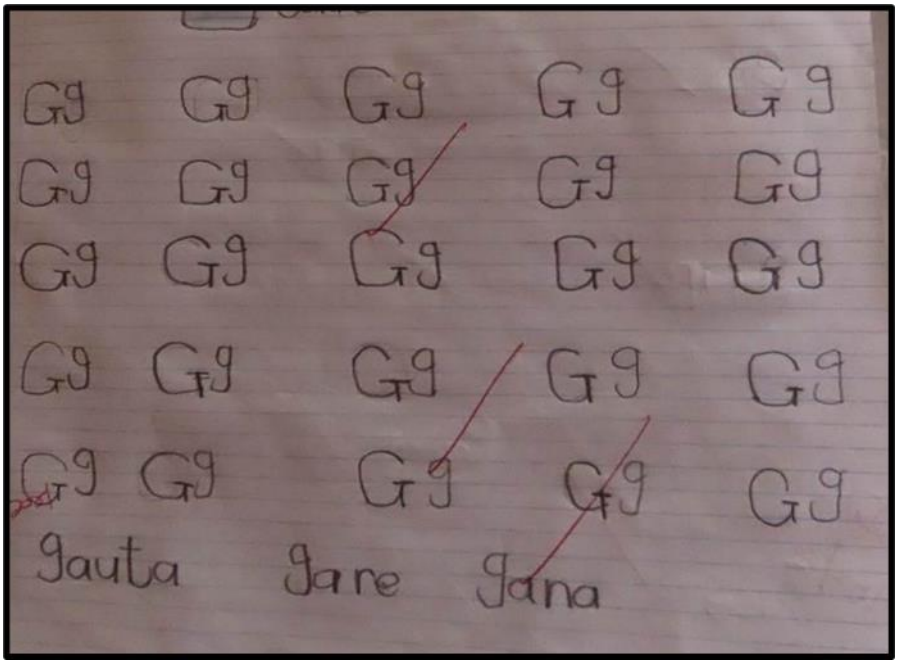
Photograph 5.3: A variety of ineffective pencil grips displayed by learners during the classroom observation at the schools



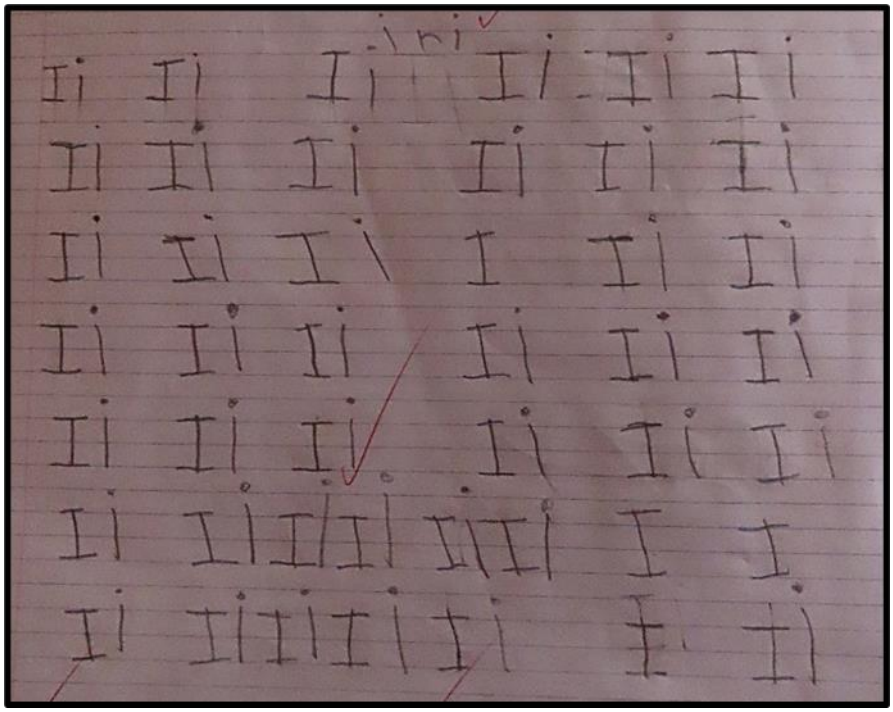
Photograph 5.4a: Teachers reported that learners did not know where to start writing in their books



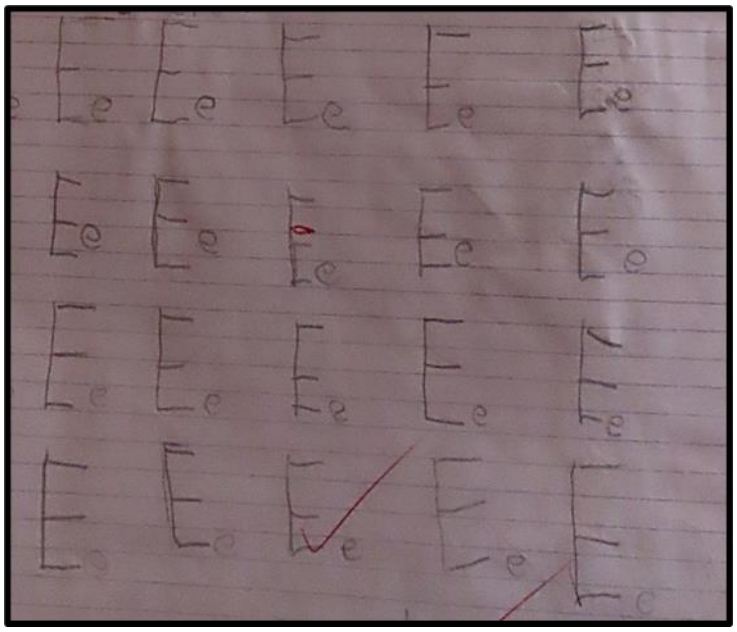
Photograph 5.4b: This learner seemed unable to follow the example set by the teacher regarding where to write on the page



Photograph 5.5a: This learner wrote the capital "G" correctly over two lines, but the size of the lower-case "g" matched the size of the capital letter



Photograph 5.5b: This learner formed the capital "I" correctly over two lines and then wrote the lower-case "i" to match the size of the capital letter

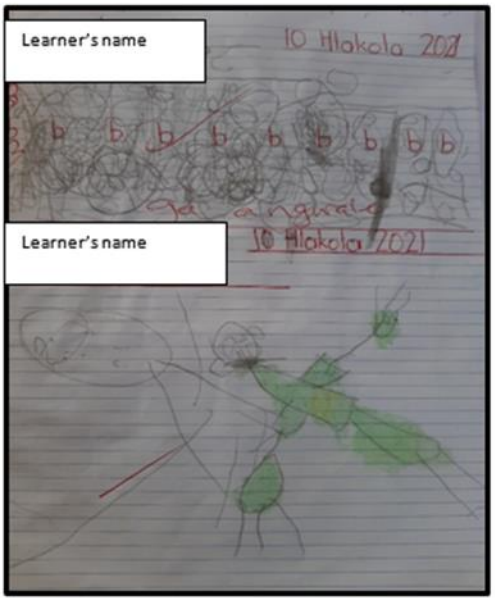


Photograph 5.5c: This learner wrote the capital "E" over multiple lines and the lower-case "e" correctly between two lines

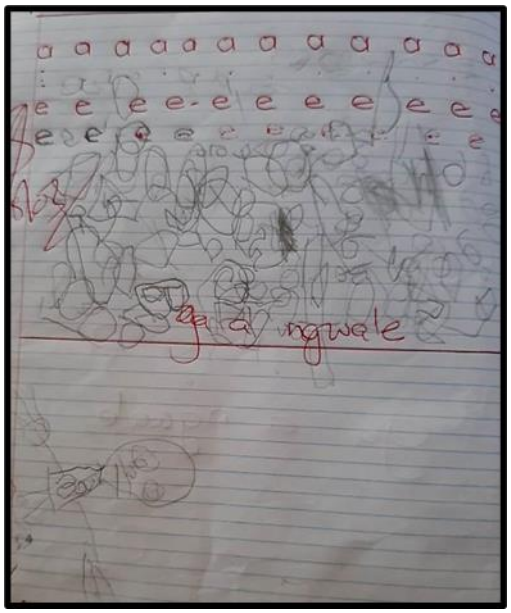
Again, the age of the learners was mentioned as a difficulty in handwriting acquisition. School readiness age and the age of admission to primary schools in South Africa seem to be commonly experienced as a difficulty by teachers. In this scenario, learners' school

readiness should be considered. Howard *et al.* (2022:371) suggest that it is necessary for learners to have reached a certain level of emotional maturity before they are introduced to formal schooling, because learners with poor self-regulation skills most often show poor academic achievement. The teachers in these sub-rural classrooms realised that the 5-year-old learners in their Grade 1 classes had not yet reached emotional maturity and were not yet able to self-regulate to be instructed in a set or structured environment. The same reasoning applies to the 5-year-old learners in these classes who reportedly rather slept than wrote. De Witt (2016:190) states that school readiness should not be measured against the criterion of chronological age but against maturity, for example, physical growth and neurological (brain) function (De Witt, 2016:178).

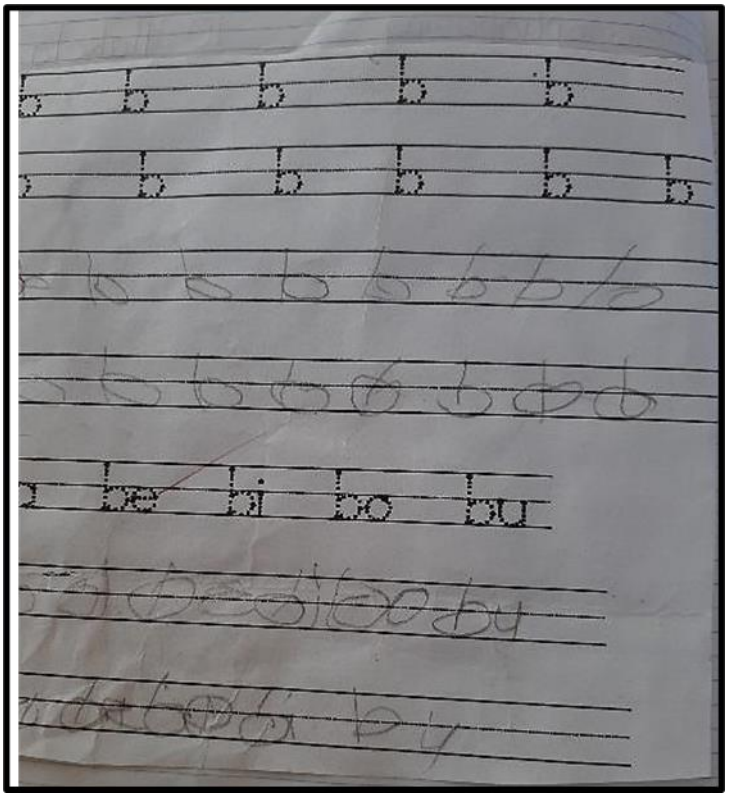
Besides the emotional aspects of being in a Grade 1 class at a young age, handwriting challenges are also clearly evident in their work. These challenges are, among others, reversals of letters and numbers and an inability to copy what they see on the board and from other sources (see photographs 4.6a–d). The errors that were highlighted by teachers were referred to as playfulness and immaturity by learners who started Grade 1 at age 5, all showing that they were not ready for formal learning. In many instances, this resulted in learners feeling inept, losing interest, and having a short attention span. Perceptually, these learners were not ready to undergo formal handwriting instruction. De Witt (2016:94) claims that perceptual development (as discussed in chapter 1) underpins learners' formal learning.



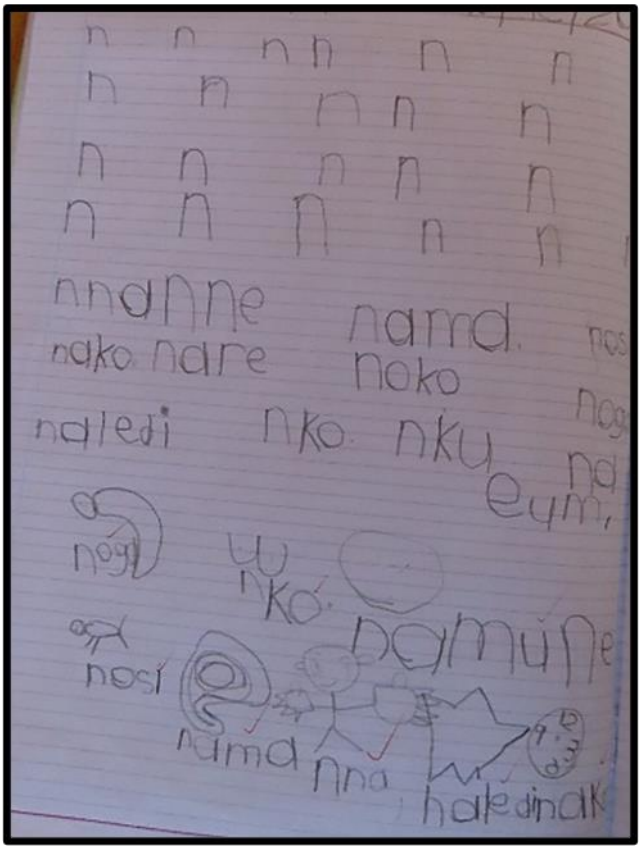
Photograph 5.6a: The work of a learner who started Grade 1 at age 5. The scribbles indicate that the learner was not ready for formal schooling yet, as described by De Witt (2016:181) and Joubert (2019:207).



Photograph 5.6b: The written work of a learner who started Grade 1 at age 5. The scribbles indicate that the learner was not ready for formal schooling: the learner had no desire to learn yet, as described by De Witt (2016:181).



Photograph 5.6c: When learners are not school-ready, they lose interest very quickly, as can be seen in this worksheet. This learner started Grade 1 at age 5.



Photograph 5.6d: While this was a valiant effort, the learner was unable to copy the work from the blackboard using the correct spacing or showing the ability to write in the lines.

Just by considering the participants' responses to questions 5 and 6, it can be concluded that learners who enter Grade 1 without attending Grade R results in the teacher having to spend more time on Grade R work, such as perceptual development and the pre-handwriting skills mentioned in chapter 1, which include postural stability, fine motor skills, pencil grip, kinaesthesia, and visual-motor integration. Van der Walt *et al.* (2020:1–2) point out that the level of a Grade R learner's fine motor competence can predict the level of progress the learner is likely to make within the following six months and that improved fine motor skills can, in turn, improve the learner's academic skills.

Question 7: *How do you address the difficulties experienced by the learners in handwriting?*

Reactions to this question ranged from "*I don't know how to address this. I didn't train for Foundation Phase*" (X1) to actual concrete strategies that were implemented in the classroom:

G3: “*We use tracing patterns before writing correctly*.”

W2: *“I give them more practice*.”

J1: “*I make a mark with a red pen so that the learners they can see where they start writing.*”

Y2: “*As the teacher, I have to direct learners by doing the dots on their books showing the big letter takes two lines and the small take one line*.”

G2: “*I use a cat structure along the red line so that they know that big letters took two lines. Small sounds like a, e, i, o, u are in the stomach only.*”

X2: “*I go step by step with the learners, showing how to write well.*”

L1: “*Sometimes, I use the dots on their books, and they trace on the dotted lines*.”

The teachers who were qualified for teaching in the Senior Phase were definitely at a disadvantage, as their responses gave one a sense of helplessness, and they even seemed overwhelmed at times. It is clear that they did not feel equipped to effectively assist the learners. Klepaker and Almendingen (2017:183) and Rantala and Khawaja (2021:2) found that teachers teach more confidently and effectively when the subject has been part of their training course – in the case of this study, handwriting instruction. Once again, it is evident that a teacher qualified to teach in the Senior Phase should not be expected to teach handwriting in Grade 1 without first being equipped with the pedagogical knowledge pertaining to handwriting instruction.

In general, the strategies most of the teachers came up with were concrete enough to apply, even though some of the strategies were a little complicated and the explanation was rather vague.

X2: “*Put fingers when they write.*” This teacher, like most of the teachers, let the learners use their index finger as a spacer before starting to write the next word.

G1: “*Only to say the ‘d’ is like an ‘a’ but different from ‘a’, because it has a long up stick and I explain and show them that we start writing from left to right.*”

Furthermore, instruction could have been a little more appropriate for the age group:

J2: “*I make them write out sentences and words again and again*.”

Sports psychologist Gareth Mole[12] (2020) writes in a blog that “practice makes permanent, not perfect” and explains that practice does not achieve much by way of cognitive restructuring. By merely giving learners more opportunity to practise the letters they do not know how to write correctly, teachers are not solving the problem; they are merely allowing the learners to imitate the letters to a certain likeness. A more dynamic approach would be for teachers to allow learners to “experience” the formation of the letter by writing the letter in the air, then writing the letter in sand, followed by practising writing the letter large on an A4 sheet of paper before attempting to write the letter in their books (Loubser & Hoogbaard, 2014:81-82).

Questions 8, 9 and 10

Questions 8–10 addressed the availability of writing materials and the types of materials used in handwriting instruction in the six sub-rural schools at the time of this study. The teachers also had the opportunity to indicate the materials they wished to have in their classrooms to enable successful handwriting instruction according to their teaching methods.

As Nel and Grosser (2016:83) point out that South African schools experience a lack of teaching and learning materials, it seemed that these questions were appropriate and information gained from them would assist in planning future handwriting tasks for sub-rural environments. However, it seems that not much had changed in the six years since Nel and Grosser published their article: the teachers’ responses indicated that generally, there were no resources and where resources were available, they were inadequate and sparse. A discussion of this situation is presented separately under each question.

Question 8: *Are writing materials such as books, pencils and crayons provided by the Department of Education, the school and/or the parents?*

The consensus from the participants was that the DoE provided all the schools’ stationery. Two of the schools did, however, indicate that the parents were requested to supplement stationery received from the DoE. Parents who were requested to supplement had tried their

[12] https://condorperformance.com/practice-makes-permanent-not-perfect/

best, but due to poverty and ignorance, only a few responded: "*Parents are asked to supplement and due to poverty and ignorance only a few responds, which results in learners sharing those few*." (J2)

One teacher responded that "*the Department provide writing materials which are not enough, and of poor quality*" (L1). Furthermore, X2 stated, "*Grade 1 learners are using small lines. They [DoE] stop to buy the big College books. Colours don't colour well, they are broken fast*", clearly suggesting that the stationery supplied by the DoE was inappropriate and of poor quality. The "big College books" the teacher referred to are A4-sized feint and margin exercise books. These books are commercially available but not supplied by the DoE. G1 indicated that the DoE provided CAPS workbooks but not exercise books: "…*books for handwriting is not provided*."

Question 9: *Do you have any input on the type of writing materials you would like your learners to have? Would you prefer specific writing materials, or are you satisfied with what the learners receive/bring*?

Eight teachers indicated that they would have liked to have additional materials such as a small blackboard, writing board, chalkboard, or whiteboard for each learner: "*[A] blackboard should be provided for each and every learner so that they can be able to practise on it before writing on their books*" (J1).

Another teacher suggested that it would have been good to have sandpaper letters available in the classroom (see figure 4.6 for sandpaper letters). W2 said, "*[y]es, I would prefer additional materials such as writing boards and sandpaper letters*".

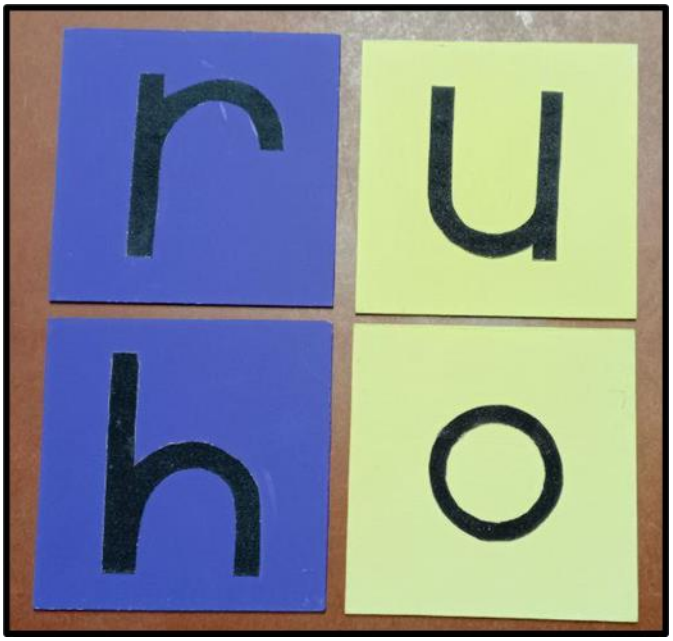


Figure 5.6: Sandpaper letters are letters of the alphabet cut from sandpaper and pasted onto hardboard squares. Learners trace over the letter to experience the correct letter formation through the tactile sense.

J2 responded: "*Whiteboards should be provided for each and every learner so that they can be able to practise their handwriting*."

W1 answered: "*I am not satisfied with the writing materials. I will prefer my learners to have the individual blackboard and chalk or individual write and wipe boards with whiteboard markers*."

Three teachers also mentioned a practical problem that they encountered with the lines on the blackboard becoming faint during the year and the necessity of these being renewed or redrawn more often. In this regard, the responses were:

G3: "*Schools must always renew the lines on the chalkboard to be visible enough.*"

W3: "*The lines on my blackboard, it's faded. The learners can't see it."* And L2: *"My board. The lines do not show anymore*." (See figure 4.7a for an example that was observed during a visit to one of the classrooms. Figure 4.7b shows the acceptable condition of a blackboard for use in Foundation Phase classrooms.)

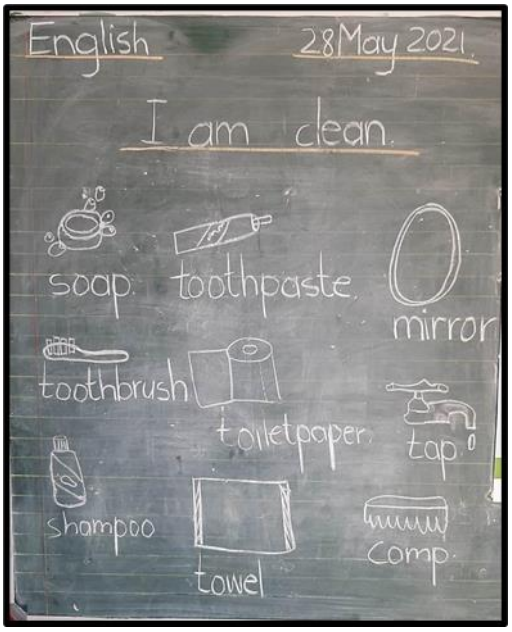


Figure 5.7a: The faded lines on a blackboard as observed by the researcher during a visit to one of the classrooms

Figure 5.7b: A blackboard with clearly visible lines and line markings

However, no specific types of writing tools and handwriting teaching materials were requested, and no participant voiced dissatisfaction. This could be ascribed to the fact that many of these teachers were unaware of the tools available to teach handwriting, their lack of training, or even their passive acceptance of the situation in which they found themselves.

Question 10: *Indicate the equipment in your classroom for teaching handwriting*

Question 10 was the final question in the questionnaire. It aimed to explore the resources that were available to the schools within the area in which this study was conducted. The teachers from the six different schools all indicated that they only had chalk and a chalkboard in their classrooms (see figure 4.8). It can thus be stated that resources for teaching handwriting at these schools were exceptionally limited. The latter as well as the challenges with the stationery provided by the DoE present a bleak picture of the teaching and learning of handwriting in this area.

All	Chalkboard	None	Individual blackboards for the learners, with chalk
All	Chalk	None	Individual write & wipe boards for the learners, with whiteboard markers
None	Whiteboard	None	Sandpaper letters, or the equivalent thereof
None	Whiteboard markers	None	Sand trays, or the equivalent thereof
None	Interactive whiteboard	None	Handwriting charts on the learners' desks

Figure 5.8: Resources available in the participants' classrooms

4.3.3 Classroom observations

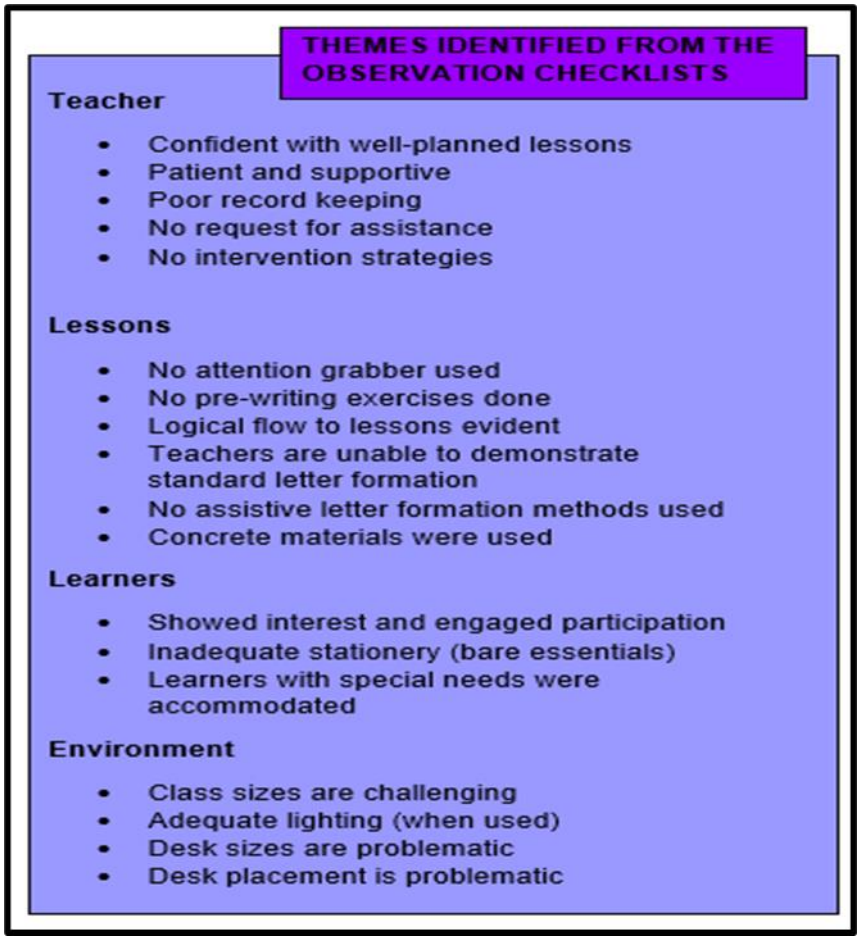


Figure 5.9: The identified themes from the classroom observations

Classroom observations were the second method used to collect data. All class visits were pre-arranged, with the researcher taking a back seat in the classroom of each of the teachers. The class visits were included in the application for ethical clearance (§ 1.12). Before taking a seat in the classroom, assent was obtained from the Grade 1 learners by learners using a visual “thumbs-up” as a way of giving assent, or “thumbs-down” as a way of refusing assent (see Annexure F).

These visits were made to observe the teaching of a handwriting lesson first-hand. The CAPS document (DBE, 2011a:9) stipulates that handwriting instruction should take place four days per week, with 15 minutes per lesson. In this study, there was no adherence to this, as the teachers declared they were not able to implement the pre-handwriting programme fully due to the COVID-19 pandemic. The pre-handwriting programme was meant to be implemented in the 15 minutes per day set aside for handwriting instruction.

During the pandemic, rotational teaching was in place at the various schools. This created reduced classes where the teachers had between 10 and 24 learners present on the day of the respective class visits. The handwriting lesson observation sessions took place over a period of three weeks.

The observation checklist that was compiled ensured that all observations were done in accordance with one standard, confirming that uniform observations of all the various classroom activities and teaching methods were done in a fair and unbiased manner (see Annexure K).

A Likert scale is a popular psychometric tool among teachers, psychologists and social science researchers because it is easy to implement and to analyse data grounded in underlying features (Anjaria, 2022:234). An example of the Likert scale used during an observation session in this study is shown in figure 4.10. The following legends were used: * Excellent; √ Good; º Average; and x Poor.

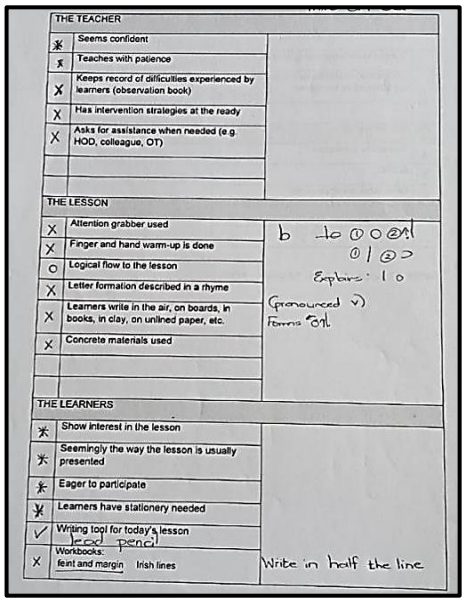


Figure 5.10: An example of the use of the Likert-scale observation schedule during an observation session in this study, using the legends * excellent, √ good, º average, and x poor

The observation checklist was divided into four sections with the following headings: the teacher; the lesson; the learners; and the environment (see Annexure K for the observation checklist). The section on the teacher aimed to explore aspects such as confidence, patience, record keeping, intervention strategies, and requests for assistance when the

teacher was not coping. The section on the lesson explored aspects of a given lesson with respect to the use of an attention grabber, finger warm-up exercises, and the general logic flow of the lesson. Also, under the heading *the lesson*, letter formation in terms of teaching strategies and the teaching material that was used were closely observed. The learner element included observed aspects that highlighted the interest shown in the lesson by the learners, the way the lesson was presented, as well as learner participation. Also, the learners' needs regarding equipment and the intervention strategies with the outcomes the teacher had implemented were noted. Lastly, the physical environment focused largely on the physical assets that were encountered in the classroom, namely classroom size, lighting, and furniture size. The findings in this regard were obtained by means of 16 class visits.

The aspects that were observed are summarised and discussed according to the headings as they appeared on the observation checklist.

4.3.3.1 The teacher

Confidence

Confidence as well as teaching with confidence are often referred to in the literature as *self-efficacy*. According to Mielke (2021:15), self-efficacy is the belief in one's own abilities. Mielke (2021:15) goes as far as to state that a teacher lacking self-efficacy usually spends a limited time in the teaching profession. Thus, as understood by the researcher, teaching with confidence reflects a teacher who is self-assured and able to guide the learners in a manner that projects this confidence in lessons that are conducted in a sure and composed way, guiding learners to academic success.

As an overview, it was noted that all 16 teachers taught with confidence. Their lessons were well prepared, and they had a clear vision of how they wanted their lesson to progress. Their words were well chosen, with clear and concise instructions. It was noteworthy to observe that these teachers had a genuine desire to empower the learners and the teachers strove to reach the stage of automaticity in the learners' handwriting.

Teaching with patience

This translates into the teacher being patient with the learners, especially when imparting new knowledge to the learners. Teachers should understand that learners must internalise new knowledge and then show their understanding by putting pencil to paper. Mielke

(2021:16) links patience to teacher efficacy in that the teacher shows a higher level of perseverance and patience. Qualities such as efficacy, perseverance and patience are vital in inclusive education because young learners should be nurtured in an environment in which they feel unthreatened and confident enough to attempt new tasks (Masalesa, 2021:151; Romel *et al.*, 2021:4).

In this study, the observations reflected these teachers as being calm and unhurried when engaging with the learners and proved to be supportive when learners were called to the front to write on the blackboard. When learners were required to point out phonics sounds on posters in the classroom, it seemed as if the environment in which the learners found themselves was nurturing, unthreatening and conducive to acquiring this new knowledge. The teachers patiently ensured that all the learners had pencils when it was time to write and ensured that everyone was ready to begin the task of writing.

Record keeping of difficulties experienced by learners

Keeping records is exceptionally important (DBE, 2011b:20; Koen as cited in Naudé & Davin, 2017:143) because an up-to-date record provides the teacher with an accurate account of learners' progress towards achievement.

During the researcher's interaction with the teachers, none of them could produce a record of difficulties experienced by the learners in their classrooms. The researcher expected that the teachers would have noted the learners' progress, challenges and needs in the form of an observation book, for example. During this study, this overt omission proved problematic when a learner was identified later in the year as needing intervention. This situation thus left the teacher without a record of their efforts to assist the learner. Furthermore, according to the requirements stipulated in the SIAS document – SNA 1 and 2 forms (DBE, 2014:48–60) – any learner in need of any type of support should be assisted by the teacher with the help of the SBST before assistance from the DBST is requested. Thus, the teacher would need evidence of efforts made to assist learners. In this study, it was noted that many of the teachers did not record learners' progress independently and did not fill in the stipulated documents that had to be used to note these problems.

Intervention strategies at the ready

The objective of inclusive education is to make education accessible to all learners (Maapola-Thobejane & Maguvhe, 2021:14). An experienced teacher would recognise difficulties experienced by learners in handwriting from previous years of teaching Grade 1. Hence, as Annandale (2019:42) found, when reversals, directionality and midline crossing, for example, show up as difficulties year after year, the teacher should be prepared with activities that can be done in order to aid a learner's development in these areas. Romel *et al.* (2021:11) found that teachers have different beliefs about what quality teaching entails and that teaching is a social occupation that extends beyond the classroom.

During the engagement with the participants in this study, none of the teachers had intervention strategies at hand, which would be a reasonable expectation of a Grade 1 teacher. Support materials such as a clay board and clay or playdough, or sandpaper letters are usually seen as concrete resources to assist learners when they experience handwriting challenges.

Requesting assistance when needed

Teacher empowerment has been proven to have a positive effect on teaching and learning, enhancing learner achievement (Maguvhe, 2021:167). According to Maguvhe (2021:168), teachers struggle to support learners with barriers to learning when inclusive education was not part of their teacher training. The DoE states in Education White Paper 6 (2001:18) that teachers are instrumental in achieving inclusive education and stipulates that SBSTs should be established (DoE, 2001:29). The support team should be active in the school, approachable and strengthened by the DBST (Preston & Van der Merwe, 2021:73).

In this study, all 16 teachers admitted that they did not seek assistance from the phase specialist, their colleagues, or curriculum advisor when their assistive efforts did not seem to benefit a learner. Whether an SBST exists or not, it is the teacher's choice to approach a colleague for advice.

4.3.3.2 The lesson

Using an attention grabber

Clements (2016) also calls an attention grabber a "lead in" to a lesson. According to

Clements, the purpose of a lead in is to get the learners interested in the topic that is about to be delivered to them. Vierstra (2016) describes an attention grabber as “a hook”, and it literally means to get the learners hooked on the topic.

The first aspect of the observation checklist in this section was to see whether the teacher was using an attention grabber to focus the learners’ attention on the imminent lesson and to get them excited about the lesson. A good example of an attention grabber would be to get the learners involved in an alliteration rhyme based on the letter that will be written in the lesson, such as “*Banna ba bona badishi*” (The men can see shepherds), “*Monna mo moketeng*” (The man is at the wedding), “*Dikoma di dirwa dikgošing*” (Initiations are taking place at the chief’s place).

More examples of attention grabbers include labelled physical objects that all start with the same letter, or the teacher wearing an apron with pictures of labelled objects, all starting with the same letter, pinned to the apron. Vierstra (2016) suggests the use of an object related to the topic, a video clip, or asking a question that leads into the topic.

None of the participants in this study used any form of attention grabbers. The result was, therefore, disappointing. In many of the class visits, the teacher positioned themselves in front of the learners and announced that they would be learning a certain sound that day. This was directly followed by the phonics lesson that then flowed into the handwriting lesson. By just adding some of the examples suggested in the literature, the researcher is sure that both teaching and learning could have been more dynamic and learning longer lasting; learning could have come alive!

Finger and hand warm-ups

Mitchell (2022) explains that finger and hand warm-ups prepare the mind for the upcoming activity while increasing the tactile sensory messages from the hand to the brain. Mitchell further explains that warm-up exercises create an awareness in the learner regarding fine motor control, as the learner then tends to focus on what the muscles are doing (Mitchell, 2022).

The researcher views the engagement of Grade 1 learners in finger and hand warm-up exercises as an opportunity to move their bodies, serving as an effective transition from the previous lesson to the handwriting lesson. Once again, during the observation lessons, none

of the teachers did finger and hand warm-up exercises with their learners.

Logical flow to the lesson

Logical flow in a lesson is achieved when a task connects to the previous task and in preparation for the next task (Van der Walt & Evans, 2019:63). This question was grounded in the CAPS document (DBE, 2011a:59), which states that handwriting is not a "stand-alone subject" and reads "[a]lign the order of teaching of the lower case letters to the phonics programme. Model correct letter formation and directionality".

Once the lessons were underway, the teachers displayed a logical flow in their lessons, moving from the phonics lesson to the writing of the phonics sound as a handwriting lesson. Fifteen of the teachers integrated handwriting with a phonics lesson. The phonic sounds that were used were "b, d, f, g, j", and "n", respectively. The sixteenth teacher presented a stand-alone handwriting lesson after a mathematics lesson.

Letter formation described in a rhyme

Letter formation is usually taught in four steps. In the first step, according to Datchuk (2015:23), the teacher models the correct letter formation while giving verbal directions. This is followed by the second step where the teacher observes the learners' writing, gives feedback and corrects mistakes. Datchuk recommends that in the third step, the learners practise the letter formation, with the teacher praising efforts and minimising support until lastly, in step 4, the learners engage in writing unguided and independently.

Teachers often provide auditory guidance for letter formation in the form of a rhyme to make it interesting and easier for learners to remember how to write the letter. Letter formation, however, was not described as a rhyme by any of the teachers in this project, and auditory clues were not given. The teachers only demonstrated letter formation on their blackboard. However, most of the teachers did not adhere to the prescribed method referred to as the Zaner-Bloser method as recommended by the DoE (see Annexure M).

Two of the teachers modelled standard handwriting with correct letter formation for the learners. Standard handwriting in South African schools is the Zaner-Bloser method, also called the "ball and stick method" (Wallace & Schomer, 1994:415) because of the round formation and straight extensions of the letters. However, there were many variations of modelling letter formation in the observation lessons. For example, one teacher

demonstrated the “b” as a vertical line, followed by an “o”. Another teacher demonstrated the “b” as a vertical line, followed by an inverted “c” attached to the line. Furthermore, the formation of “b” was demonstrated in one Grade 1 classroom as a circle, followed by a vertical line from the bottom upwards. In such demonstrations, learners are taught to lift their hand in writing the letter. However, the correct letter formation for “b” is a long downward stroke and, without lifting the hand, a short upward stroke, and in one rounded movement to the right, the “b” is completed. The letter formation of the letter “f” was correct, according to the Zaner-Bloser handwriting method. This entails starting with the rounded head, going into a downward vertical line over two writing lines, and then the hand is lifted to complete the letter with a bar (a short, horizontal line). Two of the teachers demonstrated the formation of “g” as a circle with a tail added, lifting the hand between the two actions. Another two teachers provided the learners with short lengths of wool to practise the formation of the letter “g” before writing in their books. The learners would form the letter “g” on their desks, using the wool, and the teacher checked that they were all able to produce the letter “g”. The correct letter formation of “g” is to start like the letter “c”, and without lifting the hand, performing an upward stroke just past the starting point of the “c”, and in one movement, performing a long downward stroke that flows into a curled tail to complete the letter. The formation of the letter “j” was demonstrated by one teacher as a short vertical line, followed by the tittle (the “dot” over the lower-case letter “i”) to form the letter “i”, and lastly, a tail was added to form the “j”. This formation was modelled on the board 18 times, with the spacing demonstrated between the letters as a thumb space. Yet, the correct formation of the letter “j” is to start like the “i”, but in one, smooth movement, the vertical line is formed downward, flowing into the curled tail. The hand is then lifted to add the tittle.

After these observations, the researcher could only conclude that teachers were not able to demonstrate standard letter formation using the Zaner-Bloser method due to a lack of adequate training, as mentioned in the discussion of question 4 in the questionnaire. This shows the dire impact on the writing of learners in terms of handwriting fluency. Fluency translates as automaticity when a learner can form letters without having to think about the letter first (Limpo *et al*., 2018:1344). A lack of automaticity affects learners beyond the Foundation Phase when they are not able to take notes fast enough, or in creative writing, when they have to put so much cognitive effort into letter formation that it hinders the creative thought process (Limpo *et al*., 2018:1345).

Practising of letter formation by learners

Learners write in the air, on boards, in clay, on unlined paper, et cetera (Joubert, 2019:204; Loubser & Hoogbaard, 2014:126). Visual clues are often provided in the form of dots and arrows (Datchuk, 2015:23) to encourage correct letter formation. Figure 4.11 below shows an example of a dotted letter worksheet of which the participant teachers made frequent use. (The sentences on the worksheet written in Sepedi translate as *Jacob ate delicious food. Trace the letters to complete the worksheet.*)

To promote generalisation – which means the application of the letter in different ways – Grindle *et al.* (2018:322), in working with learners with autism and intellectual disabilities, found that learners should write the same letter multiple times. Grindle *et al*. (2018:322) further promote the use of different writing utensils (wax crayon, pencil crayon, paint) in different colours and different media such as worksheets and learners' schoolbooks.

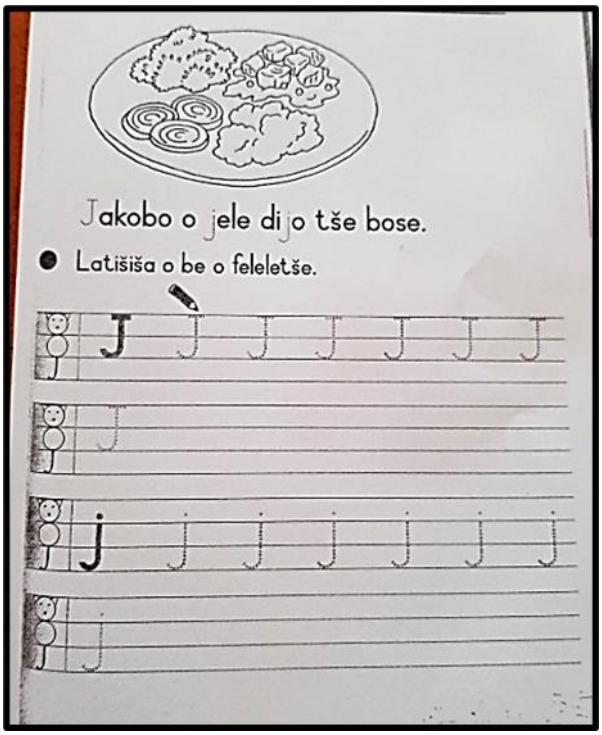


Figure 5.11: Dots and arrows worksheets provided visual clues to encourage correct letter formation

Four of the teachers (X1, L1, G1, and G2) demonstrated the formation of the letter and led the learners in writing the letter in the air before writing in their books. This is a method recommended by Bara and Bonneton-Botté (2018:197) to encourage whole-arm movement

in order to “feel” the formation of the letter, thus enhancing the visual representation thereof. OTs such as Verma *et al.* (2019: 88) recommend clay or playdough for warm-up exercises before embarking on handwriting tasks as a form of practising letter formation. Loubser and Hoogbaard (2014:126) support the latter. During the observations, no clay/playdough was used by the learners in any of the Grade 1 classrooms that participated in this study. In the classes of participants W1 and W2, learners were given two strands of wool each to form the letter “g”. In considering this concrete method of this type of assistance, it was the researcher’s view that providing the learners with only one strand of wool would have caused them to start the letter from the “c” formation, going into the upward stroke and down along the same stroke into an extended downward stroke and into the formation of the tail to complete the letter. This would have reinforced the idea that the hand should not be lifted while writing the letter “g”. By using two strands of wool, the learners formed a circle with one strand of wool, and the downward stroke with the tail was formed with the second strand of wool. Therefore, this method did not enhance fluent letter formation or positively reinforce letter formation techniques. Generally, these teachers did not use many assistive methods, and those that were used were rather ineffectual.

The use of concrete materials

The direct teaching method is an appropriate teaching method for teaching onset letters, where visual aids are used to explain vocabulary, as the learners associate the objects and pictures with the words (Van der Walt & Evans, 2019:28). Examples of the letter “b” would be **b**aby, **b**utterfly, **b**at, **b**utter, et cetera. It is important that the Foundation Phase teacher make use of visual aids either to clarify the meaning of the words used as the onset letters in a phonics lesson, or to emphasise the onset letter as the letter that will be introduced in the handwriting lesson (Van der Walt & Evans, 2019:28). In this study, a few of these methods were observed and seemed to work well, for example, where the learners were asked to point out the letter on posters in the classroom.

Participant L2 used eight large pictures, laminated on A4 cards, of the phonic sound she was introducing to the learners. These pictures depicted “*dula*” (sit), “*dikgomo*” (cattle), “*dinoga*” (snakes), “*dinku*” (pigs), “*dipuku*” (books), “*dieta*” (shoes), “*diaparo*” (clothes) and “*dikuku*” (cupcakes). The beginning sound or onset consonant “d” was indicated in red, while the rest of the words were written in black. Participant L2 went further and made a “d” of clay on an A4-size clay board. A learner held up the board while the teacher demonstrated the

formation of “d” as a vertical “l”, followed by a “c” attached to the “l”. Unfortunately, the learners did not get to use this visual aid as a tactile aid before writing the letter “d” in their workbooks. Other instances where concrete methods were used were with participants W1 and W2. These teachers had pictures of words starting with the letter “g”, as their handwriting lessons were based on this phonic sound of the week. Thus, generally, visual aides were used.

4.3.3.2 The learners

The next section on the observation checklist focused on the learners during the handwriting lesson as regards interest shown, familiarity with the teaching approach, learner participation, stationery needed, and availability and consolidation of the task in the lesson. These aspects and the accommodation of learners with special needs and intervention strategies were highlighted.

Interest in the lesson

Hedges and Birbili (2019:2) describe interest as an encounter in which the learner is fully immersed, with self-driven effort and determination, making the most of the learning opportunity.

During the researcher’s observations, interest in the lesson was regarded as the learners’ unwavering attention to the lesson presented and their willingness to participate in activities, for example, pointing out the letter on posters in the classroom. The learners in all the classes showed an interest in the lessons; they paid careful attention to the teachers’ demonstrations of the letter formation and seemed fully engaged with the teacher.

Usual way the presentation of lessons took place

From the onset of the study, the researcher made it very clear to the teachers that they should not deviate from their usual practice for the sake of the observation lesson. The researcher also undertook to maintain an unobtrusive presence at the back of the classroom, being seated immediately after the learners had given their assent. Therefore, it was easy for the researcher to observe the learners during the handwriting lessons, and it was clear that they were used to handwriting lessons presented as observed by the researcher. Thus, a true rendition of the class activity and lesson presented was obtained.

Participation

Ernst (2019:2) reports that participation is linked to outcomes and social learning. For the purpose of this study, it would mean that the more actively the learners participated in the lesson, the higher the degree of outcomes achievement would be.

The learners were eager to participate in the lessons. Participants X1, G1 and G2 called learners to the front to write the letter on the blackboard. X1 encouraged learners to find the letter “g” on posters in the classroom, and a few learners were allowed to leave their desks and point out the letter on a poster. It can be assumed that these actions encouraged learner participation.

Learners’ stationery requirements

In a poverty-stricken area – such as sub-rural Mankweng where this study was conducted – stationery is a treasured commodity. Du Plessis and Mestry (2019:1) report that the DoE does not provide all the stationery needed in the classroom. Further reporting suggests that parents in rural areas are often unskilled labourers who do not earn enough money that can be extended to school stationery (Du Plessis & Mestry, 2019:1). However, during the lesson observations, all the learners had the stationery they needed, mainly because the teachers would hand out lead pencils when it was time to copy work from the blackboard. At the end of the lesson, the lead pencils were handed back to the teacher. The teachers felt that this measure of control was necessary, because if the learners took the pencils home, they would not have brought them back. This would have then created the problem of shortage of stationery in the classroom, as not all parents were willing or able to supply stationery. However, the stationery that was observed was only the bare essentials, and there were not extra or additional writing tools to assist the learners.

Writing tool for the day’s lesson

Earlier research by Oehler *et al.* (2000) as well as Cole and Goodman (1980) recommended a pencil larger in diameter to allow for more movement and easier writing. This finding was questioned by the research of Sinclair and Szabo (2015:12), who gave evidence of no particular benefit or advantage to prescribing a specific pencil size. However, in a study by Sinclair and Szabo (2015:11), pre-schoolers preferred short, thin pencils (9 cm long and ¾ cm in diameter), while 5–7-year-olds were partial to long, oversized pencils (18 cm long and

1 cm in diameter).

Most of the Grade 1 learners that were present during observation lessons in this study used long, thin lead pencils (18 cm long and ¾ cm in diameter). Only one class (W2) used thick, triangular-shaped lead pencils (18 cm long and 1 cm in diameter). However, regardless of which pencils were used, results from these handwriting classes attested to inadequate pencil grip (see photograph 4.3) and deficient fine motor control, resulting in poor letter formation.

Workbooks: feint and margin / Irish lines

The DBE (2011a:19) prescribes the workbooks that should be used in a Grade 1 classroom. This is, however, not adhered to, as observed by the researcher.

Three of the classes observed (L1, L2, and L3) used feint and margin workbooks, and the learners would write in half a line at a time. This meant that extended letters such as the “b, d, and f” touched the top and bottom of a single line. Shorter letters such as the “c, e, and a” were written on the bottom line. This resulted in these letters being written in half the size of the extended letters. The other 13 classes all used Irish and margin workbooks. It was noticeable that the teachers often used photocopied worksheets of dotted letters. These dotted worksheets were pasted into the learners’ workbooks and used in handwriting lessons. Workbooks supplied by the DBE were noticed by the researcher in some classes but were not used in all the schools.

Learners with special needs

Learners may experience a diverse range of special learning needs that are described in Education White Paper 6 (DoE, 2001:7) and by Mophosho and Moonsamy (2021:53) as extrinsic (poverty, inadequate support for learning), systemic (inadequately trained teachers, or an inflexible curriculum), or intrinsic (cognitive ability, or sensory impairments). In this study, learners with special needs were identified by the teachers as those who were very young, that is, learners who turned 6 during their Grade 1 year. These learners were described as “playful” and “emotionally insecure” because they often cried when the teacher corrected their writing. Other learners with special needs were visually impaired learners, ranging from very mild impairment to a small number of severely visually impaired learners.

Accommodation of learners with special needs

Preston and Van der Merwe (2021:59) posit that accommodation, as is needed in learner support, involves the application of different teaching strategies to enable all learners to learn optimally. Education White Paper 6 (DoE, 2001:16) concedes that all learners are able to learn and all learners need a measure of support. Yet, Maguvhe (2021:166) states that most teachers teaching learners who experience barriers to learning have not been trained in inclusive education, which must be noted as a teaching challenge. During the observation, the more obvious special needs, such as learners wearing spectacles, tend to be more accepted and more easily assisted. For example, learners wearing spectacles need careful consideration in terms of the lighting in a classroom. The regulations relating to the Minimum Norms and Standards for Public Schools Infrastructure (2013:19), point 18(6)a stipulates the following:

> [optimal] use should be made of natural daylight to minimise the use of artificial light, and 18(6)b specifically mentions that glare should be reduced. In one classroom (L2) where learners with visual impairments were present, it was observed that the blackboard reflected the light that came in through the window, but there were no curtains that could be drawn to ameliorate the situation. However, the learners did not alert the teacher to the disturbing reflection and the class continued as usual.

Many teachers explained that the learners with more serious visual impairments as well as other learners in need of intervention strategies were generally accommodated by seating them nearer to the front of the classroom, ensuring that the teacher gave more attention to them.

Evidence of intervention strategies

Masalesa (2020:150) states that teachers adequately trained in inclusive education can implement a range of intervention strategies to support learners. As mentioned in § 0, none of the teachers in this study had intervention strategies at hand. The result is that teachers see formative assessment as an intervention, while it only serves as correction.

The teachers at School G reported that they facilitated remedial sessions specifically for Grade 1 learners after school. Upon further enquiry, it transpired that the remedial sessions

were merely opportunities for more handwriting practice. The teachers at School G had implemented these remedial sessions in the absence of an SBST, therefore relying on their own initiative. As seen in § 2.8, it would be the role of the SBST to identify and address the needs of learners, teachers and the school to support learners experiencing barriers to learning (Landsberg and Matthews, 2016:100). The teachers at schools J, L, W, X and Y indicated that they often wrote the letters at the beginning of the lines as an example for the learners to follow once they started copying the work from the blackboard.

Outcome of intervention strategies

A review of intervention strategies on handwriting for young learners conducted by Kadar *et al.* (2019:94) recommended that handwriting intervention programmes be implemented in schools. This recommendation was made when Kadar *et al.* (2019:94) found that not only learners experiencing difficulties in handwriting but also those who do not initially appear to be experiencing difficulties in handwriting benefit from intervention.

In this study, what the teachers viewed as an intervention strategy was, in fact, formative assessment. Examples in figure 4.12 below bear evidence of this. Here it is clear that the learners following their teacher's corrected version of their writing were required to follow a single repetition; however, at times, there were no repetitions.

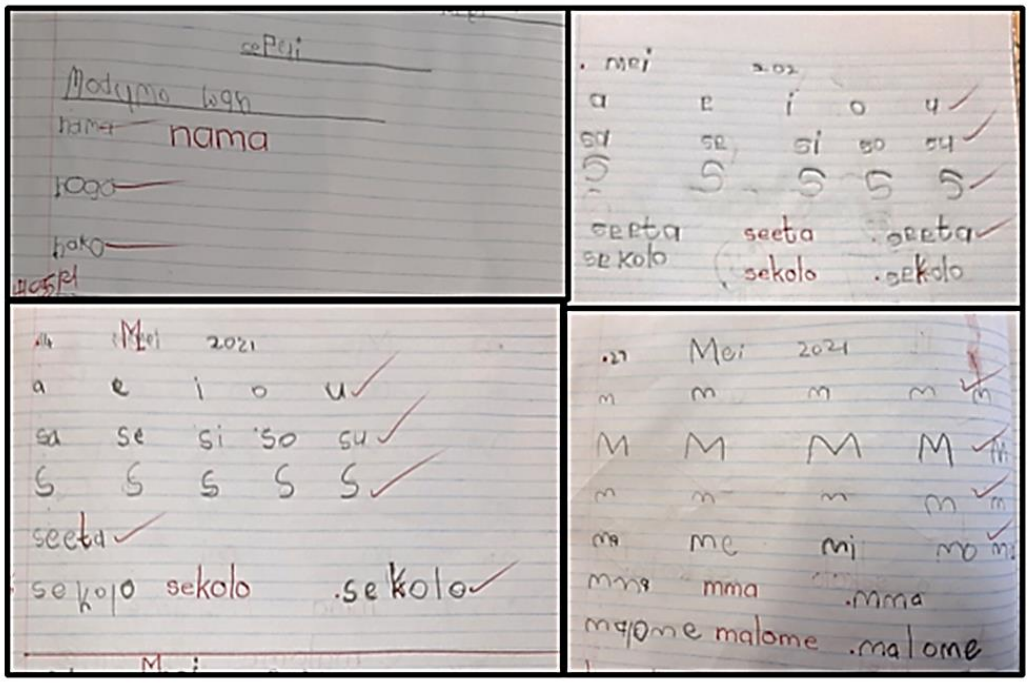


Figure 5.12: Formative assessment is viewed as an intervention, with a single or no repetition required from the learner

Beneficial intervention strategies for difficulties experienced by the learner

Despite this identified need by the teachers – that is, for teachers to be trained in handwriting instruction – Sharp and Titus (2016:28) claim that many teachers still report the lack of instruction in teaching handwriting. If teachers have not been trained in the instruction of handwriting and the factors that have a bearing on handwriting, they would not have sufficient knowledge to successfully plan (or implement) intervention strategies. Loubser *et al.* (2016:55) assert that insufficient knowledge of the instruction of handwriting can have a detrimental effect on the quality of learning. It was clear that the teachers were not exemplar as handwriting models in the Grade 1 classrooms (see § 0), which puts a negative quality on learning, as learners would not acquire sufficient speed in handwriting needed in higher grades due to incorrect, clumsy letter formation.

4.3.3.4 The environment

The last section of the observation checklist concerned the physical environment in which the teacher and learners found themselves daily – the classroom.

Classroom size

The Minimum Norms and Standards for Public School Infrastructure according to the South African Schools Act (2013:13) stipulate that floor space should be available at 1 m² per Grade 1 learner and 7 m² per teacher.

During the observation lessons, the classrooms seemed spacious, with desks comfortably accommodated within the classroom space. The learners kept their school bags at their desks during the day. On the days the observation lessons took place, the teachers had between 10 and 24 learners per class due to the COVID-19 pandemic regulations and a rotational teaching timetable; therefore, learners were divided into groups and attended school only on a certain day per week. At some schools, the learners attended school two days per week, and at other schools, the groups attended school once a week because of the rotational timetable implemented during the COVID-19 lockdown levels. Therefore, it stands to reason that the physical classrooms might have appeared more spacious and accommodating due to the diminished number of learners present; however, given normal circumstances, space and the environment could be an issue. Thus, for this study, the situation as regards the normal daily class environment could not be commented on.

Classroom lighting

Naudé and Meier (2019:4) caution that learners with special needs already have an intrinsic cognitive load to contend with, which impacts their working memory, such as learners with attention-deficit hyperactivity disorder (ADHD) having to apply themselves to concentrate on the task at hand, or learners with visual impairments who must ensure that they are able to view the blackboard clearly from where they are sitting. Working memory is said to have a very limited faculty because it can only hold up to four items during a period of concentrated effort (Cowan, 2017:1162; Wingfield, 2016:40). Naudé and Meier (2019:4) thus caution that a burden added to the working memory would hamper learning. In this study, as learners who presented with visual impairments were present in classrooms, poor lighting would then arguably add a burden to their cognitive load of working memory. As the Minimum Norms and Standards for Public Schools (2013:14) make provision for adequate power supply to all schools, lighting should not be problematic.

During the time of this study, all the classrooms had adequate lighting in the form of fluorescent lights; however, four teachers preferred not to switch on the lights. Those classrooms appeared somewhat dim, but the learners did not seem perturbed by the insufficient lighting.

Appropriate desk sizes

Alibegović *et al*. (2020:91) relate that Grade 1 learners spend the greatest part of their school day in a sitting position when they write, draw, or listen to their teacher while a lesson is presented. These authors caution that muscle fatigue can set in and learners may develop musculoskeletal disorders, bad posture and back pain due to prolonged sitting. Alibegović *et al*. (2020:91) therefore advise schools that desks and chairs should be regarded as basic, yet vital components in the classroom – not only for the sake of learning but also for the health preservation of learners.

Although most of the classrooms had desks in appropriate sizes for the young learners, three classrooms used square, plastic pre-school tables that were clearly too small for the learners. The seating arrangement brought about by the use of these plastic tables was also not conducive to learning, because the learners had to turn their heads sideways in order to see the blackboard. If the teacher moved the desks in horizontal lines, only half of the learners would have faced the blackboard and the other half would have had their backs to

the blackboard. In another school, one classroom also used square, plastic pre-school tables, but the size was suited to the learners due to most of them being very young in the grade. Yet, even in this classroom, the learners had to turn their heads sideways to see the blackboard.

4.3.4 Focus group discussions

Creswell and Creswell (2018:187) describe focus group interviews as a qualitative data collection method where few unstructured and open-ended questions are asked, with the intention of eliciting the views, opinions, understanding and observations of the participants. Focus group discussions were deemed the most effective way to obtain first-hand impressions from the teachers as to the effectiveness of the content of the pre-handwriting programme, the duration of the activities, the implementation of the pre-handwriting programme, and the need for and availability of resources.

The final data collection method in this study was the three focus group discussions. These discussions were held with three different groups of teachers on three different days and at three different locations to afford all the teachers the opportunity to give feedback amidst the COVID-19 pandemic. As the focus groups could not guarantee confidentiality, participants were requested to keep information shared during the focus group discussion confidential.

The researcher felt that these focus groups were not as successful as desired, as there seemed to be a real lack of participatory dedication and involvement. Participants were apathetic and tended to hold back and rather waited for others to answer, even though the researcher did all she could to encourage and facilitate the group. Reasons for this could have been that teachers were not enthusiastic to attend a group discussion after class and felt it was more of a burden and that they wanted to finish quickly. There also seemed to be a slight language barrier and teachers did not want to participate and speak out.

The following sections discuss the thematic analysis.

4.3.4.1 Thematic analysis of the data collected during the focus group discussions

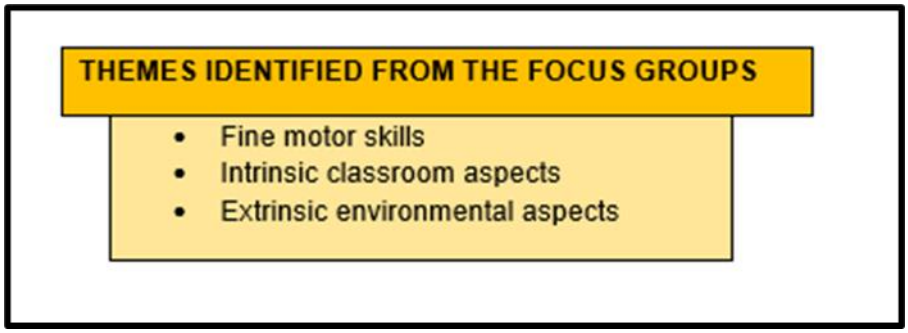


Figure 5.13: Themes identified during the focus group discussions

Braun and Clarke (2022:11) describe focus group discussions as an interactive method of data generation, and therefore it is crucial to check and recheck the transcriptions of the focus groups, as current, valid data are generated during focus group discussions. Clarke and Braun (2018:4) assert that an in-depth analysis of data moves from a summarised description of the data to interpretation of the data, with the researcher actively seeking for themes and themes not merely emerging from the data (see § 1.10).

The focus group discussions were audio-recorded with participants' permission. These discussions were transcribed verbatim by the researcher, whereafter thematical analysis was conducted. The researcher continued by checking and rechecking the transcriptions for themes that would speak to the research questions.

4.3.4.1.1 Coding of the themes

The coding process of the transcripts of the focus group discussions was done manually because of the manageable sample size of 16 Grade 1 teachers. An example of how the data were coded for analysis is set out in table 4.1. A full illustration of themes and sub-themes appears in figure 4.14.

Table 5.1: An example of the coded data analysis

Raw data	Understood by the researcher as…	Theme	Sub-theme
'The learners do not know how to use a pencil'	Comfortable pencil grasp and manoeuvring the writing tool	Fine motor skills	Pencil grip
'I am left with 2 kids that are struggling to write in lines only. They can write, but they can't write on the lines straight.'	The learners are able to write in the lines, but the writing deviates in quality	Intrinsic classroom aspect	Midline crossing Spatial orientation
'There are some learners that they can't be able to write between the lines.' 'And you're using the thin Irish and Margin lines?'	Learners are unable to write within the lines	Extrinsic factor	Writing materials
'Okay, when we start to write, they must focus on their hand. We must put our hands together and exercise their hands. They must put their hands like this and then like this. Because they come here young, most of them didn't do that.'	Learners that are younger in the grade	Fine Motor Skills Intrinsic classroom aspect	Finger exercises 'I am left with 2 kids that are struggling to write in lines only. They can write, but they can't write on the lines straight.' Warming up exercises
'More especially the hand exercises during the winter season when the kids came to school they were feeling cold and then we'd do some exercises, some few more exercises where they put their hands on the table, and also with their hands for the arrow directions, the up, down, left and so. It helped them to warm up their fingers when they write.'	Learners benefited from the exercises	Intrinsic classroom aspect Intrinsic classroom aspect	Warming up exercises Arrows chart

4.3.4.2 Themes and sub-themes identified from the data that emerged from the focus group discussions

Three main themes were evident. Various sub-themes were further identified from these main themes. The main themes were fine motor skills, intrinsic classroom aspects and extrinsic environmental aspects (see figure 4.13).

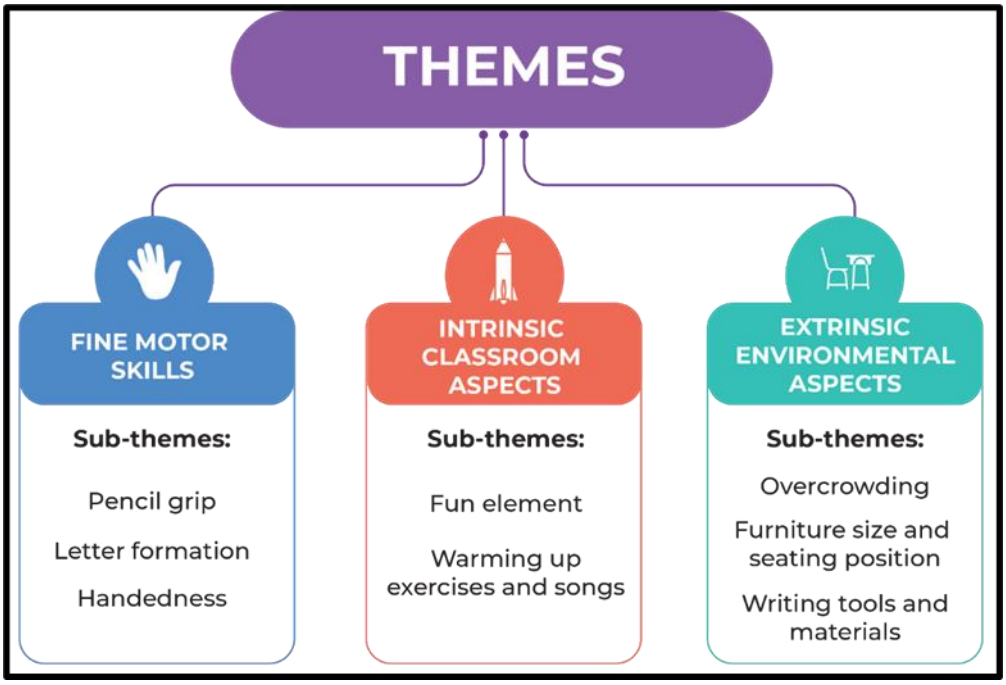


Figure 5.14: Themes and sub-themes from the focus group discussion

4.3.4.2.1 Theme 1: Fine motor skills

The first theme reflects the aspects of fine motor skills (see figure 4.15).

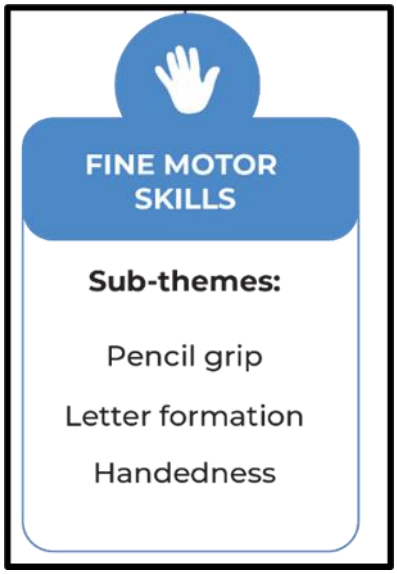


Figure 5.15: Theme 1 – Fine motor skills

Fine motor skills can be defined as the coordinated movements of the small muscles in the fingers and hands, employed in manoeuvring objects, such as holding a pencil (Armstrong-Carter *et al.*, 2021:888). *Fine motor skills* was the first theme, with sub-themes *pencil grip*,

letter formation, and *handedness* (see figure 4.15). The three sub-themes all involve a level of fine motor coordination skill and control.

Pencil grip

There was a consensus that persistent problems were evident in the learners' pencil grip: "*learners do not know how to use a pencil*" (L3) and "*the learners struggle to hold a pencil*" (G1). As many of the responses indicated that the participants did not implement the programme or were sometimes unaware of the programme, the researcher jumped in and tried to provide solutions and educate the participants regarding the handwriting programme. Therefore, concerning this aspect, at least this challenge was identified by the participants, which coincided with literature (e.g., Odokuma & Ojigho, 2019:121) that confirms that the dynamic tripod grip is the most recommended pencil grip. This is because the dynamic tripod grip allows for continuous smooth movement of the thumb away from the wrist with the least muscle tension, curbing fatigue in muscles while writing. Strengthening of the fine motor muscles of learners was needed, so the researcher demonstrated to the teachers the "pinch and flip method" to the dynamic pencil grasp (see figure 2.4) and discussed finger exercises with the teachers. Another aspect that highlighted the fact that the learners needed to improve their fine motor skills was when the researcher asked about the clothing-peg activity. One group of teachers said they did not realise that it was a "game", meaning they did not realise they could make a game out of the one clothing peg they used at the end of the learners' books to prevent the pages from curling up to strengthen fine motor skills in learners. The researcher explained the activity in detail:

> … even if each child brings one peg from home and he can take it and put it on the book, take it off, put it on his desk, pick it up, open it up, put it on (attach it to) his book, put down his hand, open it (the peg) up…..just the putting it down and picking it up from the desk, work these little muscles in his fingers, and the pinching to open it and put it on the book and to take it off also exercise these small muscles. Even if each child brings one clothing peg from home, you don't need 12 or 24 pegs per child in your classroom. (Researcher)

In the focus groups, the researcher attempted to ameliorate the situation and provided suggestions, as it seemed that the teachers did not know how to assist these learners, how to use the programme, or just did not take the time to apply the exercises.

Letter formation

Prunty and Barnett (2020:121) describe letter formation as a writing pattern, with the understanding of where to start writing the letter, the direction in which to move the writing tool, and how to follow on through the structure of the letter until the letter is complete. This proves just how intricate the skill of handwriting is, and it reiterates why optimal handwriting and ample opportunity for practice is needed for handwriting to become automated (Botha & Africa, 2020:728). Prunty and Barnett (2020:126) concede that the starting point in letter formation is crucial, for example, writing the letters "e", "f", "v", et cetera, reminds the learner of the direction the letter needs to follow.

This topic did elicit a better response, as participants noted this aspect and added that the learners struggled to write on the lines: "*they can write but they can't write on the lines straight*" (J3); "*there are those struggling*" (J2); "*yes … some learners can't be able to write between the lines*" (J2). J1 then added, "*because they don't know small letters and big letters … they started writing ... the differences between small letters and big ones…eish!*" (J1).

Letter formation is dependent on spatial orientation. The teachers' responses bear testimony to this when they said that learners were not able to write between the lines, which is a function of spatial orientation (see photograph 4.6d). Furthermore, effective teaching strategies are instrumental in the acquisition of correct letter formation, and from this study, it is evident that the learners did not have the benefit of dynamic, interactive teaching strategies such as air writing, writing in sand, writing on unlined paper, and auditory clues such as rhymes to remind them of the starting point and execution of the letter.

Handedness

Reyes *et al.* (2019:2243) opine that handedness is linked to gross motor development and that right-handers are more coordinated than left-handers. In the classroom context, this would simply mean that left-handers might need support in the acquisition of handwriting, as was indeed a finding of this study.

There was a discussion on learners who write with their left hand. Some of the respondents identified the challenges that occur with these learners. Y4: "*The child that writes with the left hand.*" Y2: "*But do we encourage them to use the right hand?*" As there were no concrete suggestions on how to assist these learners, the researcher provided an example and demonstration: "*… if you want to help the left-handed child, then the child sits and writes like*

this ... then you come here and stand here (demonstrating on the left side of the learner's seated body) and put your right hand over the child's left hand and then you write with him" (Researcher).

It was encouraging that the participants recognised the barriers a left-handed learner experiences and took the opportunity to seek assistance from the researcher, even though they did not fully implement the programme.

Conclusions regarding the fine motor skills theme

The general challenge that the Grade 1 teachers experienced with the implementation of the pre-handwriting programme was to correct the learners' pencil grip, especially the pencil grip of left-handed learners. The challenges with letter formation could stem from teachers' insufficient pedagogical knowledge, as all the teachers omitted the concrete stage of teaching letter formation. Krog (2020:320) affirms that learners learn through sensorial experiences, while Naudé (2020:15) emphasises that teachers' teaching style should accommodate all learners' learning styles, including the tactile-kinaesthetic learner. In teaching handwriting, this means that learners need to experience letter tactilely before attempting to write the letter. Tactile experiences in handwriting include sandpaper letters (see figure 4.6), writing in sand, forming the letter with clay or playdough, and painting the letter on a large sheet of paper such as a double sheet of newspaper with a thick paintbrush. Therefore, the learner experiences the shape of the letter before attempting to write the letter on paper and in lines.

Another noteworthy experience regarding the implementation of the pre-handwriting programme in this study was the impact of the COVID-19 pandemic, according to the teachers. The COVID-19 situation resulted in a rotational school timetable. According to this timetable, learners attended school one to two days per week. It is regrettable that the teachers were not more proactive, seizing the opportunity to work more intensively with the smaller groups of learners present in the classroom each day.

4.3.4.2.2 Theme 2: Intrinsic classroom aspects

The second theme that was identified is intrinsic classroom aspects, with sub-themes *fun element* and *warm-up exercises and songs* (figure 4.14).

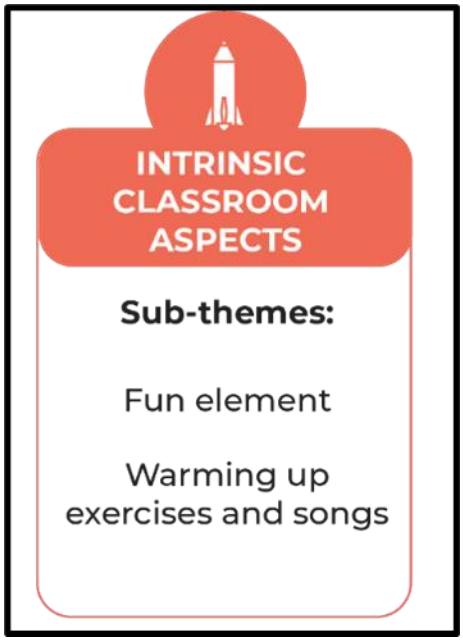


Figure 5.8: Theme 2 – Intrinsic classroom aspects

This theme reflected intrinsic classroom aspects that can be defined as the elements contained in the presentation of a handwriting lesson. Van der Walt and Evans (2019:55) encourage teachers to know the dynamics of the group of learners as their audience in order to plan an appropriate lesson that would benefit the group. This translates into the teacher's choice of teaching strategy and activities to make learning fun and interesting to the young learner. Relating to this study, the three sub-themes that are discussed are the *fun element* that was evident while participating in the pre-handwriting programme and the *warm-up exercises and songs* that were used.

Fun element

Those who did implement the programme reported that the learners enjoyed some of the activities: "*… those exercises ... the ones with the [chair] push-ups, they did enjoy them*" (G1). The group echoed this: "*…they benefit by them*" (Focus group, 2 September 2021). The fun element extended to the basic warm-up exercises. These movement activities were thoroughly enjoyed by the learners, as X3 commented: "*… I would say that the exercises came in very handy. They liked it …. as they warmed up during the winter season when the kids came to school, they were feeling cold and then we did the exercises*."

Furthermore, the songs also brought in the element of fun as participant X1 added: "*… you know what… we know that the children are always happy then (after singing) …. Then we begin to teach*". The fun element was also taken "home" – one respondent (G1) commented

"*… yes… even at home… with the grandkids I tried it with them*".

Although education is a serious matter, the researcher laments the teachers' hesitancy to make learning fun for Grade 1 learners. Most of the teachers were quite taken aback when it was blatantly stated by the researcher during the demonstration sessions that the activities were meant to be fun for learners. Yet, the fact that G1 took the activities to her grandchildren makes it plain that the activities in the pre-handwriting programme succeeded in being fun.

Warm-up exercises and songs

Many of the exercises proved to be great fun for the learners, and besides the fun element, these exercises proved useful and facilitated the teaching and learning of handwriting: "… *some few more exercises where they put their hands on the table and also with their hands for the arrow directions – the up down left and so […] They came in handy it helped them warm up their fingers when they write*" (X3).

This participant also added the following:

> *…you know what, we know that the children are always happy when we start to teach them how to write or do something … we must make up a song or maybe to wake them up … they must be awake. Like they are supposed to do (wake up) …the body and the heart. So, you say ... Okay... stand up and then you can tell them that they sing…head, shoulders, knees and toes…* (X3).

It was clear that these activities were a) thoroughly enjoyed by the learners and b) they were of remarkable use to encourage engagement and interaction in the classroom situation. This shows that we do not need expensive resources in teaching and learning to make learning fun. The songs supplied with the pre-handwriting programme were also popular, as the teachers confirmed that the translations were effective and easy for the learners to master due to the repetition of words. X3: "…*the third verse is the same"* (meaning it was easy). One of the songs translated into Sepedi serves as an example:

GO GATA O GATOGA

(Rhythmic)

La nngele, la go ja, la nngele, la go ja, la nngele!

Leoto la nngele! Leoto la go ja!

Letsogo la nngele! letsogo la go ja

La nngele, la go ja, la nngele, la go ja, la nngele!

The English version of this song is:

MARCHING

(Rhythmic)

Left, right, left, right, left

Left foot, right foot

Left arm, right arm

Left, right, left, right, left.

Conclusions regarding the intrinsic classroom themes

Play is defined as a relaxed physical and emotional state of happiness and laughter, free from strict conformity, resulting in free choice of participation (Movahedazarhouligh, 2018:587). An environment conducive to teaching and learning is an environment in which young learners are allowed to learn through discovery, exploration and play (Movahedazarhouligh, 2018:587). Play encourages full inclusive participation of all learners, and therefore play-based learning has become increasingly popular over the past few decades (Danniels & Pyle, 2022:1). Play-based learning makes learning fun, because it

makes learning less formal and holds benefits, such as improved language skills, physical health, cognitive development, and social relationships with peers (Danniels & Pyle, 2022:9; Movahedazarhouligh, 2018:588). The warm-up activities and the songs and rhymes incorporated movement. Young learners need to move to learn. Webster *et al.* (2019:726) advocate for movement integration throughout lessons during the school day because of the proven advantages in terms of behaviour, participation, and increased learning. It is this sense of freedom, choice and spontaneity that leads to active participation that the researcher envisaged in the compilation of the pre-handwriting programme. The activities included in the pre-handwriting were meant to be play-based to make learning fun, engaging and incidental for young learners.

4.3.4.2.3 Theme 3: Extrinsic environmental aspects

The last theme identified from the focus group data, *extrinsic environmental aspects*, with its sub-themes, is shown in figure 4.15.

Figure 5.9: Theme 3 – Extrinsic environmental aspects

The theme *Extrinsic environmental aspects* was assigned to influences highlighted by the teachers that were outside of their personal control. These aspects included learner numbers, furniture size with the seating challenges, writing tools and materials and, of course, the COVID-19 pandemic situation.

Learner numbers (overcrowding)

Naudé and Meier (2019:9) recommend that the number of Grade 1 learners in South African classrooms be reduced to allow more time for teachers to provide individual support to learners, which would have a positive impact on learners' academic performance. The document on the Minimum Norms and Standards for Public School Infrastructure (2013:14) stipulates a maximum of 40 Grade 1 learners per teacher in one classroom. However, in reality, it is a different scenario.

One of the focus groups did not heed the questions on the pre-handwriting programme, but primarily focused on understaffing issues and related many of the teaching problems to extrinsic problems. Participant Y4 stated: "*… the biggest problem is overcrowding*". This statement immediately sparked a heated reaction with participant Y5, who added "*the teachers are not enough*". Participant Y2 then also added that "*the government is having a problem… the learners are too uhm … so one teacher has so many learners – one teacher has 35 learners*". This topic revealed the frustration that was generally experienced by most of the teachers, with various responses reflecting a large number of learners in the classroom (participant Y1 stated that there were 49 learners in her class; and participant Y2 had 56 learners in her class; and participant Y4 stated that she had 60 learners in her class). These numbers reflected overcrowding, and as participant Y4 stated, "*there are lots of various difficulties at this school*", which obviously compounded the situation.

The teachers agreed that the large class sizes made it impossible for the teacher to assist learners experiencing barriers to learning. The teachers, therefore, resorted to giving the learners experiencing difficulties in handwriting one or two sentences as extra handwriting practice for homework. The parent was then expected to help the learner while the learner wrote out the same sentence: "*…I try that, but because of the time, it is too little. Then I try to contact the parent so that they can take interest and I give him, or her, maybe 3 or 4 sentences to write*" (Y2).

The teachers seemed to realise that the homework strategy was not the best solution to assisting the learners experiencing difficulties in handwriting. As Y2 said: "*At least, I see a little bit improvement for doing that.*" Overcrowding deprives Grade 1 learners of quality education by making it difficult for the teacher to give individual attention to learners. Learners experiencing barriers to learning especially need the teacher's support.

Furniture size and seating position

Furniture should be in line with the physical requirements of learners to ensure that they are seated comfortably and able to write comfortably. Alibegović *et al*. (2020:90) report that it has long been suggested that schools make use of adjustable desks and chairs to suit the requirements of learners to minimise bodily fatigue due to classroom furniture that is too low or too high relative to the physical size of the learner (§ 2.5.2)

Participant Y4 felt the need to share with the group that she was perturbed by the seating arrangement in her classroom: "*… the challenge I think we are all having is the seating arrangements of the learners*". She gave the following reason for this: "…*other learners are sitting this side and others are sitting the other side. So, when they write some of them to get confused. Like some of them, when they write a certain letter for example 'ef' or 'f' they are facing the other side, then they face in the wrong direction*" (Y4).

The teachers were unhappy about the furniture size in their classroom, as it affected the learners' letter formation in terms of directionality. The learners could not always clearly see the modelled letter formation when the teacher wrote on the blackboard, and they saw the writing of learners seated opposite them in a mirror image. Participant Y5 noted: "*… so some are going to start writing from the right-hand side to the left*". When further exploring other seating challenges and seeing if the classroom environment had small plastic chairs and tables, participant Y3 stated: "… *mine does not [classroom furniture size] … Mine are even big for the kids, when they write they prefer to stand. They can't reach. It's too high*". When asked how they rectified the situation, they replied "*we can't … our students are so many – we don't have space*" (Y4).

Photographs 4.7a and 4.7b were taken by the researcher during the classroom observations and show that learners were not comfortable at the desks that were too high or in the chairs that were too low for them. The incorrect furniture size affects body posture while writing. This could lead to fatigue, as the learner must exert postural muscles just to get the pencil to paper, and it is not conducive to neat handwriting.

Photograph 5.7a: This learner sits at the edge of the seat and was seen lifting herself onto her toes to reach for her book to write.

Photograph 5.7b: The chair is too low for the learner, measured by the length of the learner's legs. This causes the learner to slouch forward in a posture that is not conducive to neat handwriting.

As stated in § 1.2.1, 30–60% of learners' school day is spent on fine motor tasks, of which 84% are handwriting tasks. It makes sense that learners should be comfortably seated, affording them the opportunity to aspire to the teacher's expectations of quality work. In the sub-rural community of Mankweng, where poverty reigns and learners have access to education at the behest of the South African Government, suitable furniture should be provided.

Writing tools and materials

The final sub-theme was aspects of writing tools and materials.

Participant J2 alluded to the learners' inability to write in the lines and clarified that those learners were expected to write in Irish and Margin exercise books, which Grade 1 learners should not be writing in, as these books have narrow lines. However, one must always take into consideration the available resources that schools must make do in these sub-rural areas. However, even with these limitations, teachers from School Y had had great success with the pre-handwriting programme. One of the classes won a trophy for handwriting at a competition held by the DBE the week prior to the focus group discussion. Improvement in handwriting at the other schools might not have been trophy-worthy but was still appreciated and celebrated.

When asked if the teachers had any suggestions for the pre-handwriting programme, the responses were unanimous that they valued the programme, or at least, the parts that they had attempted to implement. One response was by Y4: "*These things that you introduce to us [Y1 interjects: 'They are fine.']. I don't think there is anything that is bad that we can cut it off or maybe just cut because we don't want that*."

Photographs were taken of learners' workbooks that teachers brought along to the focus group discussions. The progress and improvement in learners' work were a source of pride to the teachers. Seven sets of examples are shown in figures 4.16 to 4.22 where learners started writing in the first school term of the South African academic year in 2021, the progress made, and the result at the time of the focus group discussion in September 2021.

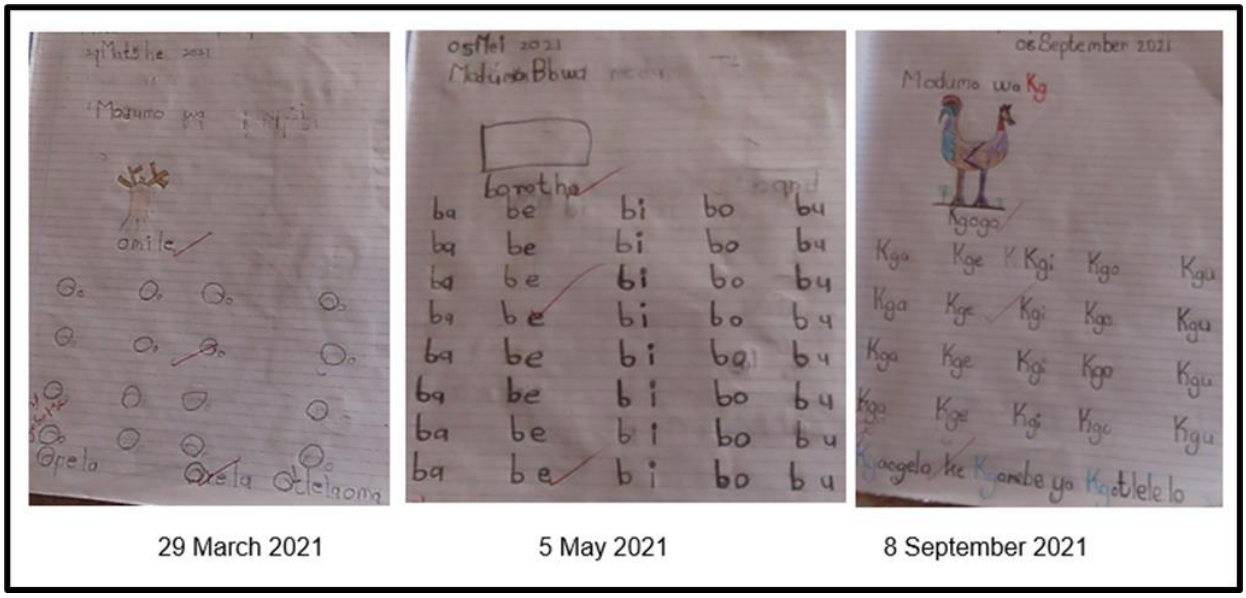


Figure 5.10: This learner's work is shown towards the end of the first school term in 2021; May is nearly in the middle of the academic school year; and the learner's work at the time of the focus group discussion in September 2021.

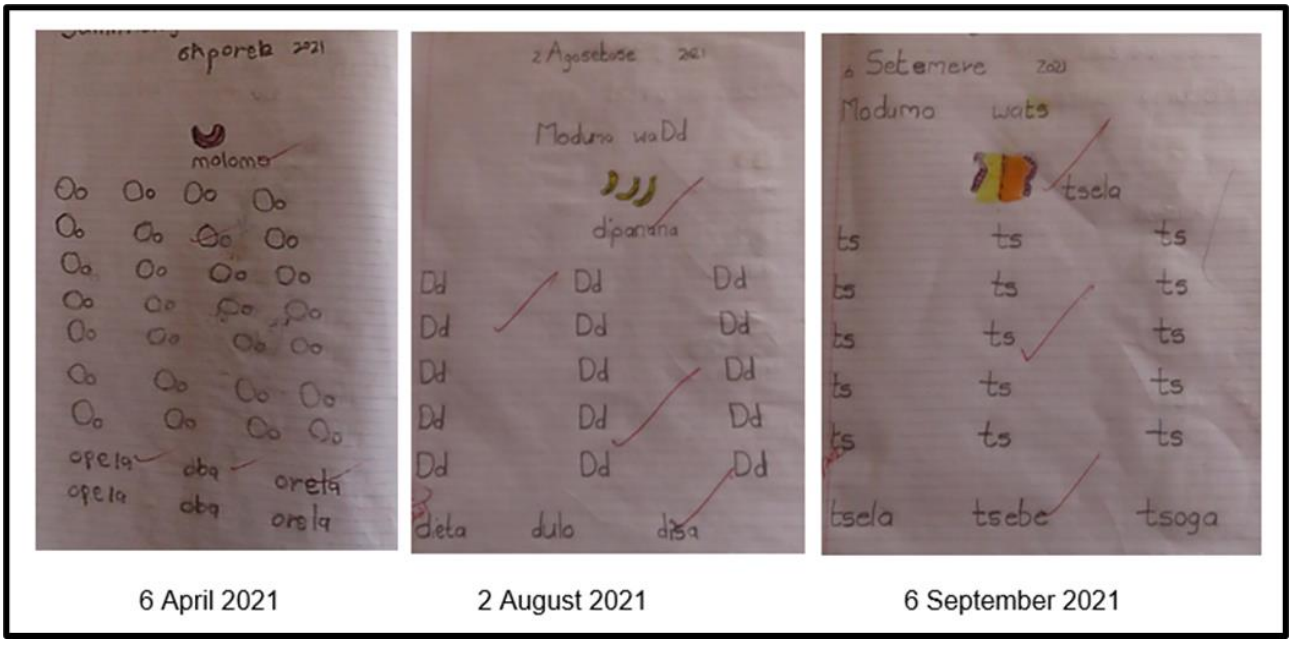


Figure 5.11: This learner's work is shown towards the end of the first school term in 2021. The pre-handwriting programme was implemented in May 2021. The learner had shown marked progress at the time of the focus group discussion in September 2021.

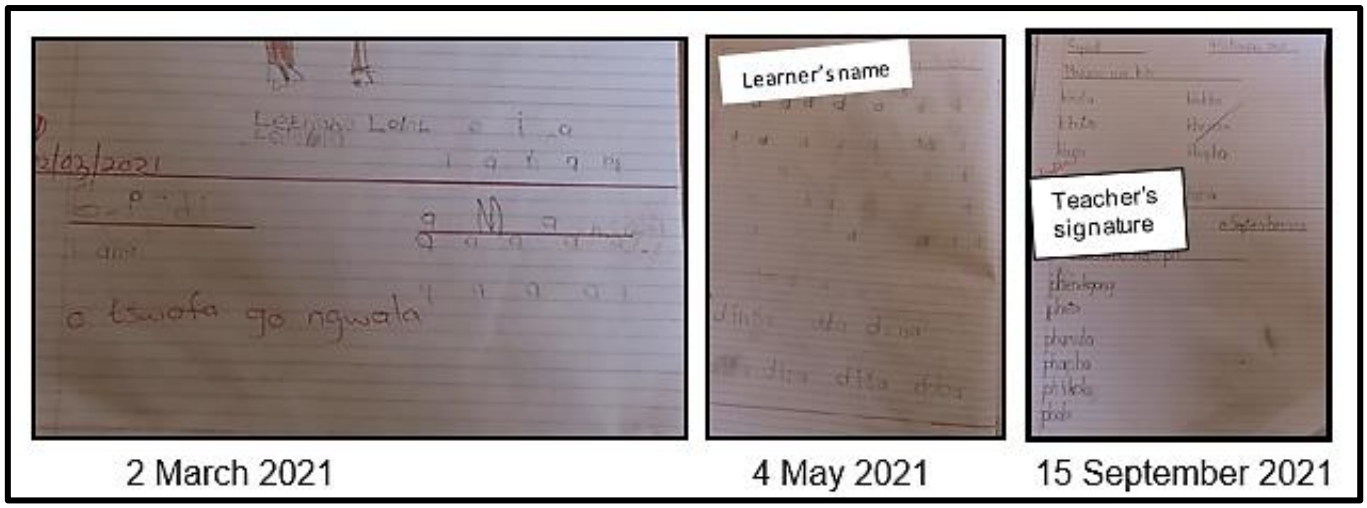


Figure 5.12: This learner's work is shown towards the end of the first school term in 2021. The pre-handwriting programme was implemented in May 2021. The learner had shown progress at the time of the focus group discussion in September 2021.

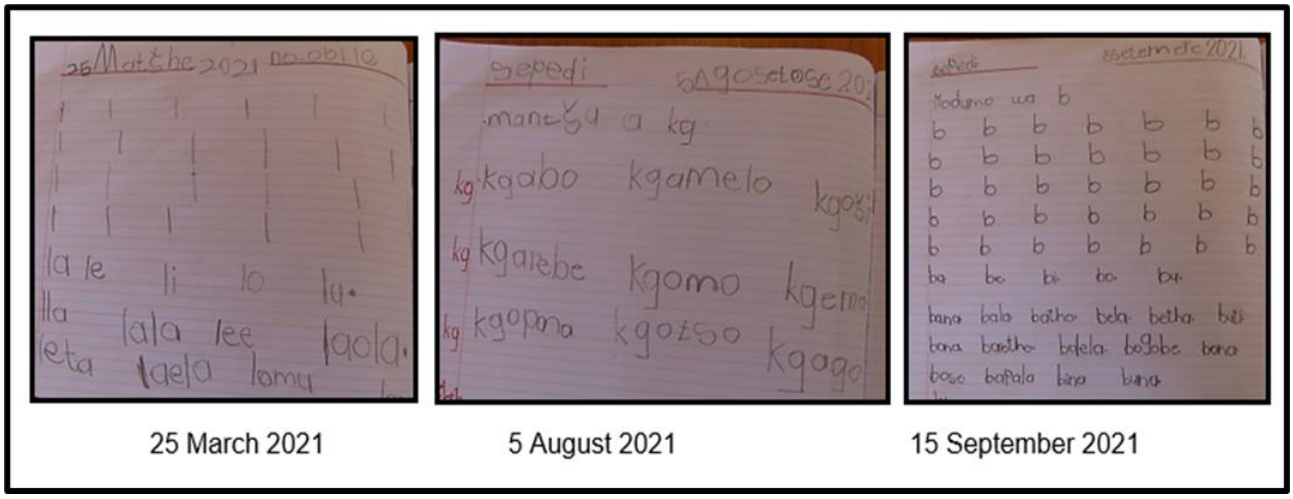


Figure 5.13: This learner's work is shown towards the end of the first school term in 2021. The pre-handwriting programme was implemented in May 2021. The learner had shown progress by August and had made marked progress by September 2021.

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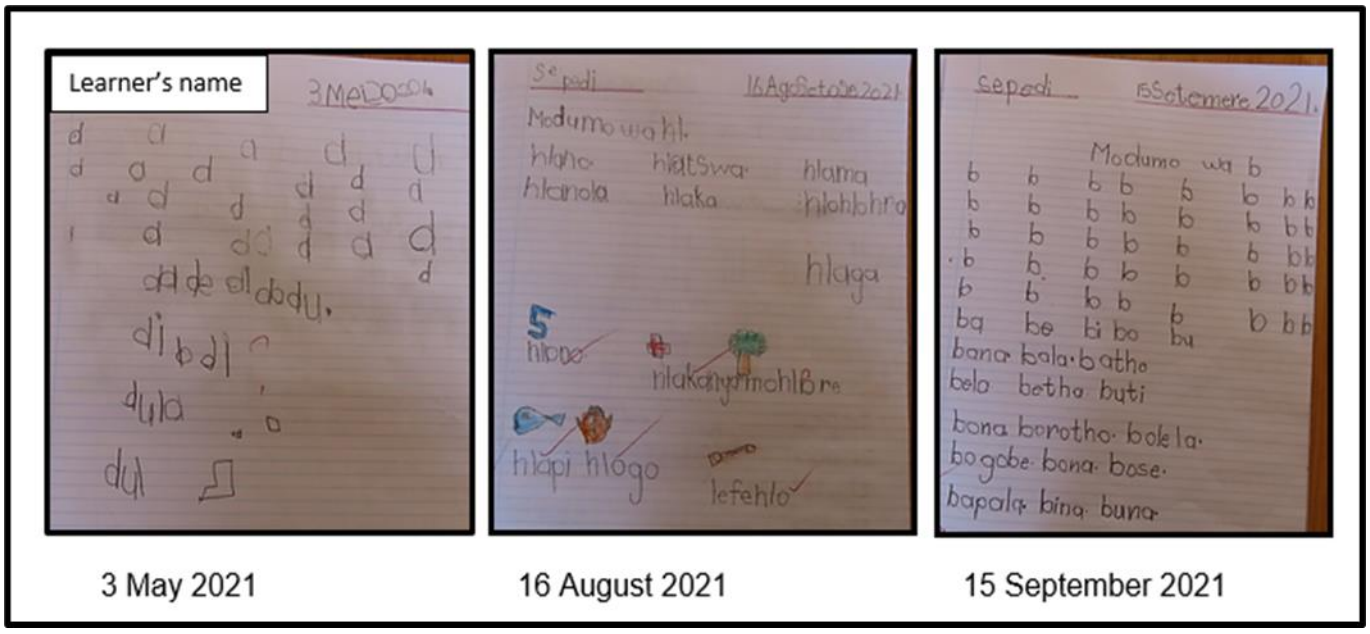


Figure 5.14: This learner's work is shown just before the implementation of the pre-handwriting programme in May 2021. The learner had shown progress by August and had made marked progress by September 2021.

Figure 5.15: This learner's work is shown towards the end of the first school term in 2021. The learner had made some progress before the pre-handwriting programme was implemented in May 2021. Yet, the learner had shown marked progress before the focus group discussion in September 2021.

Figure 5.16: This learner's work is shown towards the end of the first school term in 2021. The learner had made some progress before the pre-handwriting programme was implemented in May 2021. Yet, the learner had shown marked progress before the focus group discussion in September 2021.

The progress shown by these learners is encouraging, considering that the teachers did not fully implement the pre-handwriting programme. Still, not all learners made satisfactory progress, and this can be attributed to various reasons, such as the pre-handwriting programme being implemented to a minimal extent, the teaching strategies used, the writing tools (pencils and books), and a host of other possible reasons. Nonetheless, the successes are celebrated, and it is hoped that they will serve as further motivation to the teachers to implement the pre-handwriting programme.

After the thematical data analysis, the perspectives of the participants highlighted how the identified themes affected the teaching and learning of handwriting in the sub-rural area of Mankweng. The theme *fine motor skills* – with sub-themes *pencil grip*, *letter formation* and *handedness* – seemed to have had the most profound impact on the teaching and acquisition of handwriting. These three sub-themes can be dubbed the foundation of handwriting acquisition, because the learner must have an established dominance in one hand to determine which hand will be trained in pencil grip. Then the learner must master a dynamic pencil grip to engage in letter formation. Ample opportunities and experiences in letter formation should lead to automaticity where the learner masters handwriting without having to think of the formation of the letter first.

The second theme, *intrinsic classroom aspects*, are accompanied by the sub-themes *fun element* and *warm-up exercises and songs*. These aspects can very easily be incorporated in the flow of the daily programme and classroom management. The young learner cannot

be expected to remain seated for long periods; learners learn through movement. Thus, the warm-up activities provide opportunities for movement without causing disruptions in discipline. The activities are engaging, prompt full participation and prepare a learner's hand and wrist for the task of writing, but beyond this, they relax the body so that a good writing posture can be assumed during the task of writing.

Some of the challenges experienced by the Grade 1 teachers under the theme *extrinsic environmental aspects* were beyond the scope of this study, as these challenges also included aspects such as a shortage in staffing and overcrowding in classrooms as well as furniture size. SMTs and the DoE should address these aspects. A more manageable aspect was the sub-theme *writing tools and materials*. Stationery and books requested from the parents as well as the stationery supplied by the DoE were a difficulty that could be overcome if the CAPS policy document was read and properly understood. However, it can be noted that the teachers were doing their best with the stationery that were available to their learners.

Conclusions regarding the extrinsic environmental aspects

The regulations relating to the Minimum Norms and Standards for Public Schools, accompanying the South African Schools Act 84 of 1996 was published in the Government Gazette on 29 November 2013. This document addresses infrastructure, with floor space indicated as 1 m^2 per Grade 1 learner, 2 m^2 per learner with physical disabilities, and 7 m^2 per teacher in each classroom, with a maximum of 40 learners per class (2013:14). While the teachers lamented the transgression of these stipulations, these factors were beyond the scope of this study. However, stationery and furniture are aspects that can undoubtedly be addressed by the relevant authorities in the interest of optimal teaching and learning.

4.4 TRIANGULATED CONCLUSION OF ALL THE DATA GENERATION METHODS

Triangulation is a technique to analyse results of the same study using different methods of data collection (Creswell & Creswell, 2018:200). For this study, it was implemented to enhance validity to create a more in-depth picture of the research problem and to explore different ways of understanding the research problem (Merriam & Tisdell, 2016:245). Thus, triangulation checks the differences that the methods and observations of the same phenomenon produce, highlighting the similarities and inconsistencies in the data that do or do not align. Triangulation is elaborated on in chapter 5.

4.5 SUMMARY

This chapter described the findings of the study and the conclusions reached in each theme. In the final chapter, recommendations in accordance with the research questions are aimed at teachers, schools and the DBE to enhance pre-handwriting skills in an inclusive setting. The limitations of this study are outlined, and the contribution of this study is discussed.

CHAPTER 5: SUMMARY AND CONCLUSIONS

5.1 INTRODUCTION

The researcher set out to implement a pre-handwriting programme to fill the void in the CAPS document to the benefit of all Grade 1 learners and to create an inclusive classroom environment for teaching handwriting. The compiled pre-handwriting programme was envisaged as a standard document in Grade 1 classrooms, enabling Grade 1 teachers to successfully prepare Grade 1 learners for formal handwriting instruction. After reviewing the literature, the researcher identified several areas where knowledge could be expanded and included in the pre-handwriting programme.

This chapter summarises the journey that was undertaken by the researcher, highlighting the research question, aims and objectives, and the final outcomes that were noted. Furthermore, the potential contribution of the pre-handwriting programme is highlighted, followed by a discussion of the limitations of the study and future recommendations. This chapter concludes with a final comment on the study.

5.2 SUMMARY OF ACHIEVEMENT OF AIMS, OBJECTIVES AND THE RESEARCH QUESTION

The following discussion is an attempt to weigh the findings against the main research question.

5.2.1 Response to the primary aim and objectives

This study aimed to fill the void left by the CAPS document – that is, the document not prescribing a pre-handwriting programme (DBE, 2011a:19). Even though a pre-handwriting programme is recommended (DBE, 2011a:19), such a programme has never been prescribed or defined. Thus, to compile a pre-handwriting programme would lessen or eliminate barriers to learners' perceptual development and enable teachers to identify difficulties that may result in barriers to mastering the skill of handwriting. This study did achieve this aim, as a pre-handwriting programme was compiled and implemented in 16 Grade 1 classes in six sub-rural schools. Furthermore, the said programme was accepted with enthusiasm, and feedback from the participants suggested that it alleviated the

challenges faced by learners and facilitated the identification of many of the encountered difficulties. The main advantage of this study was that teachers – especially those who were not fully trained as Foundation Phase teachers – were made aware of perceptual challenges in learners, and this was an added benefit.

In order to highlight the identified pre-handwriting void in the CAPS document, the following objectives were set. These practical actions included the compilation of a pre-handwriting programme that would be made from simple, easily acquired resources, easily obtained in the local communities. This made the pre-handwriting programme sustainable and easily reproducible. The intention was that this pre-handwriting programme becomes a standard document used in Grade 1 classrooms to encourage learners to perform their handwriting tasks in a way that is simpler and fun. To answer the main research question, the objectives were set as steps to achieve the aim and answer the research question.

A six-step curriculum development approach (Thomas *et al*., 2016) was followed, which assessed the needs, goals, objectives and outcomes of the pre-handwriting programme.

- The pre-handwriting programme was designed and implemented in 16 Grade 1 classrooms in a sub-rural area in the Limpopo province over a period of six weeks.
- Feedback was required from the participating teachers.
- The programme was refined based on this feedback.

The initial six-step approach addressed the objectives, which identified the needs, namely fine motor skills (including pencil grip, letter formation, and handedness); intrinsic classroom aspects (the fun element, warm-up exercises and songs); and extrinsic environmental aspects (overcrowding, furniture size and seating position, and writing tools and materials). The goals of this approach were to compile a pre-handwriting programme that would benefit all learners – a play-based programme with activities that can be achieved within 15 minutes per day, using affordable, everyday objects where apparatus was needed.

By applying the six-step curriculum approach, the need for the pre-handwriting programme was identified, which led to devising a suitable programme to fill the void in the CAPS document. This satisfied the second objective.

The teachers provided spontaneous feedback during the focus group discussions. This assisted the researcher to refine the programme and provided an excellent opportunity for all to reflect on the process. The personal contact with the teachers in these contact sessions

satisfied the last objective, refining the feedback, and enabled the researcher to adjust the pre-handwriting programme. The outcomes were positive, as almost all of the teachers acquired new knowledge and teaching practices and obtained insight into their own teaching shortfalls and challenges.

5.2.2 Response to the secondary research questions

The secondary research questions that guided and directed the focus of this study are now discussed, highlighting their assistance in answering the main research question. Six secondary questions were asked, and each one is individually discussed.

- To what extent can the elements identified by Annandale (2019:54-64) be accommodated in the compilation of such a programme?

The pre-handwriting programme was formulated based on previous research, and all the elements identified by Annandale (2019:54-64) were considered and intensively used in the construction of the said programme.

- To what extent can fine motor skills (including pencil grip and letter formation), visual memory (including direction, space and reversals), intrinsic physical aspects (including low muscle tone and midline crossing) and extrinsic environmental aspects (including seating position and writing tools) form the basis of a pre-handwriting programme that will assist in the optimal development of Grade 1 learners in an inclusive setting?

Fine motor skills proved to be of the utmost importance in all handwriting skills. Thus, it was absolutely vital to develop these skills, and they must be considered as a major focus point in any exercise or task connected to the learning and development of handwriting. Fine motor skills formed the basis of the pre-handwriting programme for Grade 1 learners in an inclusive setting.

- Is it possible to compile a comprehensive pre-handwriting programme with resources that are everyday objects, or easily obtainable, in a sub-rural area?

By using everyday discarded or recycled objects, this pre-handwriting programme could be devised and implemented. In the case of this study, positive results were seen. The programme was compiled to be comprehensive enough to cover all the developmental

needs of the learners, motor skills and the essential handwriting skills needed by Grade 1 learners in an inclusive class setting.

- Will Grade 1 teachers experience a uniform set of assessments as helpful in the decision to either support or refer the learner for occupational therapy?

Evidence from the questionnaires and the focus groups reinforced this aspect. The pre-handwriting programme seemed to highlight many of the motor skill challenges the learners experienced, and by bringing this to the teachers' attention, they had the confidence to either remediate the problem or refer learners to an OT. To succinctly answer this question, one can say the knowledge the teachers had gained from this assistive pre-handwriting tool gave them power and confidence to act appropriately.

The purpose of this study was to compile a Grade 1 pre-handwriting programme to promote inclusive practices in the classroom; the present challenge in the current Grade 1 classroom situation regarding pre-handwriting skills prescribed in the CAPS document (DBE, 2011a:19) is that implementation is usually according to Grade 1 teachers' own interpretations of instruction.

The compiled Grade 1 pre-handwriting programme to promote inclusive practices in the classroom was a notable success. Owing to the simplicity and availability of equipment, this programme can be reproduced and used in similar educational contexts for years to come.

5.2.3 Response to the main research question

What should a South Africa relevant pre-handwriting programme look like that will speak to the handwriting development of Grade 1 learners within an inclusive setting?

In response to the main research question, an affirmative answer can be given. The compiled pre-handwriting programme was relevant to the South African Foundation Phase education environment. This programme fills the gap regarding the teaching of handwriting. Furthermore, the elements identified by Annandale (2019:54-64) were accommodated in ways that speak to the handwriting development of Grade 1 learners within an inclusive setting.

5.3 THEORY, POLICY, AND PRACTICE CONTRIBUTIONS

The theory used in the current study truly reflected the underpinnings of the topic under investigation. Activity theory (AT) provided a solid ground for the actions in which the participating teachers, the learners and the researcher were engaged. The essence of this study revolved around the activity of teaching and learning handwriting and the activities (pre-handwriting programme) that precluded the acquisition of this important skill. This theory aligned exceptionally well with all the activities in this study. The theoretical underpinning facilitated the answering of the research question and directed the activities that obtained the most applicable and appropriate data. AT also underpinned the research methodology.

The research findings underscored the need for handwriting instruction to be included and optimally taught at tertiary level in teacher training programmes. Furthermore, the findings vouch for the inclusion of a specific pre-handwriting programme as is stated in the CAPS policy document (DBE, 2011a:19). The pre-handwriting programme also provided a space for inclusive education, as it entailed tools and actions that involved all learners. Additionally, as is stated in Education White Paper 6 (DoE, 2001:16), the pre-handwriting programme recognised that all learners could learn and needed support. Together everyone was able to learn the indispensable art and skill of handwriting.

The outcome of this study proves useful to researchers in the field of education, as this study certainly adds to present knowledge on handwriting. Likewise, relevant topics are contained in this thesis, such as the importance of handwriting instruction, the physical development of handwriting, ergonomic components of handwriting (e.g., furniture size, seating posture, the dynamic tripod pencil grip and how to attain it, and paper placement), and components of handwriting (e.g., perceptual-motor development, in-hand manipulation, fine motor coordination, and visual-motor integration).

5.4 LIMITATIONS OF THE STUDY

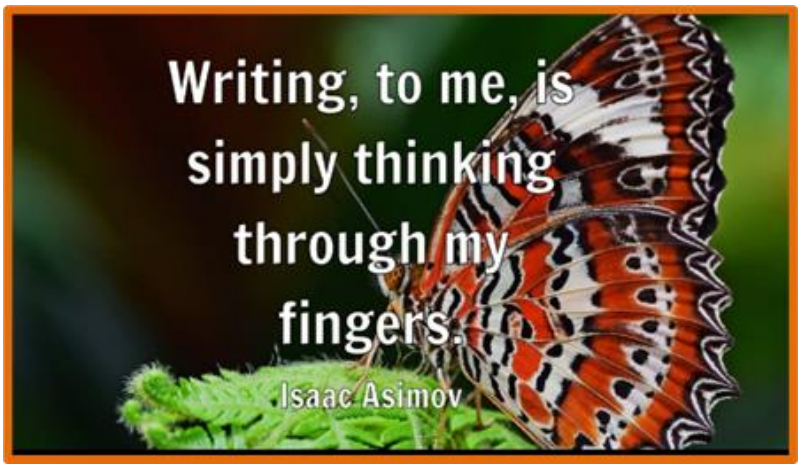
The generalisability of the results is limited by the context of the participants and the learners who were observed in the sub-rural school setting. These findings might differ should a study be conducted in well-resourced schools or urban schools. The current study was conducted in a sub-rural area in six Quintile 3, non-fee-paying schools during the COVID-19 pandemic.

5.5 RECOMMENDATIONS FOR FUTURE RESEARCH

It is recommended that research be conducted on the implementation of the pre-handwriting programme in schools in sub-rural areas without the influence of the COVID-19-pandemic and in schools that are situated in an urban environment.

5.6 CONCLUSION

The aim of this study was to compile a pre-handwriting programme that would prepare Grade 1 learners to undergo formal handwriting instruction. The findings of this study can be regarded as valuable, as the aspects identified in the needs assessments were addressed and proved successful in terms of the types of activities as well as the educational strategies that were employed. Photographic evidence in this study showed a marked improvement in learners since the implementation of the pre-handwriting programme. This study has concurrently extended the literature for a pre-handwriting programme, with assessment criteria attached as well as original rhymes and songs written specifically for the programme. The results of this study show that a pre-handwriting programme can fill the void in the CAPS document and that Grade 1 learners in an inclusive setting can benefit from a six-week pre-handwriting programme.



Downloaded from https://www.brainyquote.com/quotes/isaac_asimov_382193

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ANNEXURE A: REQUEST FOR PERMISSION FROM THE DEPARTMENT OF EDUCATION TO CONDUCT RESEARCH IN PUBLIC SCHOOLS IN MANKWENG CIRCUIT, CAPRICORN SOUTH DISTRICT

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

For admin. use Reference number:

1. **PARTICULARS OF THE RESEARCHER(S)** (if there is more than one researcher involved, provide the details of the main researcher)

1.1. Personal details	
Title (Prof/Dr/Mr/Mrs/Ms):	Mrs
Surname and initials:	Annandale R
First name/s:	Rene
SA ID number:	6712020046086
Work permit number (If not SA citizen):	
1.2. Contact details	
Tel home:	015 296 0308
Tel work:	015 268 4812
Cell:	074 155 9397
Email address:	reneannandale649@gmail.com
Home address:	13 Wilge Street Polokwane
Postal code:	0699
Postal address:	PO Box 649 Fauna Park
Postal code:	0787

2. PARTICULARS OF AFFILIATED ORGANISATION (if applicable)

2.1. Affiliated organisation	
Name of organisation:	North-West University
Position:	Student
Head of organisation/research promoter:	Dr LD Preston
Tel (head/research promoter):	018 299 4765

2.1. Affiliated organisation	
Email address (head/research promoter):	Lynn.preston@nwu.ac.za

3. STUDENT AND POSTGRADUATE ENTROLMENT PARTICULARS (if applicable)

3.1. Enrolment particulars	
Name of institution:	North-West University
Degree/qualification:	PhD
Faculty and discipline/area of study:	Humanities / Special Needs Education
Name of supervisor/promoter:	Dr LD Preston and Dr W van der Merwe
Student number:	21104775

4.1. Purpose of the research (please indicate by placing a cross where appropriate)	
Undergraduate study – Self	
Postgraduate study – Self	X
Private company/agency – Commissioned by National Government Department	
Private research by independent researcher	
Non-government organisation	
Department of Basic Education	
Commissions and committees	
Independent research agencies	
Statutory research agencies	
Higher education institutions only	
Other (specify)	
4.2. Details of proposed research	
Full title of research project/thesis/dissertation	

A Grade 1 pre-handwriting programme to promote inclusive practices
Brief description of proposed research
Grade 1 teachers from 6 schools in Mankweng will implement the pre-handwriting programme in their classrooms over a period of 6 weeks. The programme will be evaluated at the end of the period to discuss improvements.
Value of the research to the National Department of Basic Education This pre-handwriting programme aims to fill the void in the CAPS document whereby it is stated that a pre-handwriting programme should be followed. Yet, no pre-handwriting programme has been described.
4.2. Details of proposed research
The pre-handwriting programme consists of activities compiled for 5 schools days per week, 10 minutes per day, for 6 weeks. The programme is classroom-based and will be implemented by the Grade 1 teachers.

Envisaged date of completion of research at the DBE (day/month/year):	31 March 2021
Envisaged date of submission of research report and research summary to DBE (Month/Year):	December 2023

5. REQUEST OF INTERVIEWS WITH DBE OFFICIALS

5.1. DBE official details	
Name of official/s requested to interview*:	6-10 Grade 1 teachers
Unit/division:	Mankweng district
Area of interest of research (if you do not know the name of a particular DBE official/s you would like to interview):	

* *If you do not know the name of the official in the DBE that you would like to interview, specify the unit or area of interest for your research, and the RCME Directorate will advise accordingly.*

5.2. Key questions for the DBE official (also attach a draft questionnaire)

6.1. Request for datasets available to the DBE (please indicate by placing a cross where appropriate)	
Education Management Information System (“EMIS”)	No
Grade 12 examination results	No
Former Systematic Evaluations	No
Annual National Assessments (“ANA”)	No
National Education Infrastructure Management System (“NEIMS”)	No
Personnel Salary System (“PERSAL”)	No
6.1. Request for datasets available to the DBE (please indicate by placing a cross where appropriate)	
Learner Unit Record Information and Tracking System (“LURITS”)	No
Other (specify)	
6.2. Data should be disaggregated by: (please indicate by placing a cross where appropriate)	
Gender	

Race	
Age group	
Geography (urban/rural)	
Province	
Time period (specify)	
Other (specify)	
6.3. Request for supporting letter for access to the options below (please indicate by placing a cross where appropriate)	
Provincial Department of Education	X
National Government Departments (specify)	
Trends in International Mathematics and Science Study (“TIMSS”)	
Progress in International Reading Literacy Study (“PIRLS”)	
The Southern and Eastern Africa Consortium for Monitoring Educational Quality (“SACMEQ”)	
Data from the World Bank	
Data from the HSRC	
Other (specify)	

7. ATTACTHMENTS (please indicate which of the following attachments are accompanying this form)

7.1 Attachments (please indicate by placing a cross where appropriate)	
Approved research proposal	X
Draft questionnaire for DBE official/s to be interviewed/survey for DBE officials	X

to complete	
Ethics clearance for study	X
A letter from your supervisor confirming	
7.1 Attachments (please indicate by placing a cross where appropriate)	
registration of your course (university students)	X
Other (specify)	

If you have any additional comments/concerns, please specify them in the box below.

This form, along with the relevant documentation should be emailed to research@dbe.gov.za. All queries pertaining to the status of the research request can be directed to Mr T Tshirado at tshirado.t@dbe.gov.za or Ms S Mabasa at mabasa.s@dbe.gov.za

ANNEXURE B: PERMISSION FROM THE SCHOOL GOVERNING BODY OF EACH SCHOOL TO CONDUCT THE RESEARCH STUDY IN THEIR SCHOOL

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222

School for Education Sciences
Tel: 0182994765
Fax: 0182994238

SCHOOL GOVERNING BODY CONSENT FORM

I herewith wish to request your consent to participate in this research, which involves teachers from primary schools. Before you give consent, please acquaint yourself with the information below.

The details of the research are as follows:

TITLE OF THE RESEARCH PROJECT:

A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

PROJECT SUPERVISOR: Dr LD Preston
CO-SUPERVISOR: Dr W van der Merwe
ADDRESS: Faculty Education Sciences

School of Education

Educational Psychology
NWU, Potchefstroom Campus

CONTACT NUMBER: 018 299 4765

MEMBER OF PROJECT TEAM: PhD-Student: Mrs René Annandale
ADDRESS: 13 Wilge Street, Flora Park, Polokwane, 0699
CONTACT NUMBER: 0741559397

This study has been approved by the Ethics committee of the Faculty of Education Sciences of the North-West University and will be conducted according to the ethical guidelines of this committee. Permission was also asked from the Department of Basic Education as well as the school principal.

What is this research about?

The purpose of this action research study is to fill the void in the CAPS document by compiling a pre-handwriting programme that will benefit learners inclusively, and use resources that are easily obtainable, if not everyday objects, to ensure accessibility for all Grade 1 learners and primary schools. An added advantage to a standardised pre-handwriting programme will be the uniform assessment of each learner against an appropriate age and developmental standard.

Participants

- Six Grade One teachers from six sub-urban schools.

What is expected of the school?

The Grade 1 teachers will implement a pre-handwriting programme over a period of six weeks, between January 2021 and March 2021.

They will identify difficulties and successes experienced regarding

- the time allocation,

- content,
- implementation,
- type of activities,
- resources and
- inclusive practices used in the pre-handwriting programme.

These aspects will be reported upon to the researcher during a focus group interview, where all the participating Grade 1 teachers will be present.

Benefits to your school as participant

It is believed that the teachers as participants will benefit by being more aware of pre-handwriting skills Grade 1 learners should master before embarking on formal handwriting instruction. The pre-handwriting programme will assist the teachers by providing activities that is aimed at the learners' development towards this end, and also provide assessment criteria aimed at the developmental level of the learners.

The researcher will explain the pre-handwriting programme and demonstrate the activities to the teachers beforehand, and will be available for advice throughout the process.

Risks involved for participants

No risks involved. Teaching and learning should continue as usual, with no special emphasis on the research project.

Confidentiality and protection of identity

The researcher undertakes to not disclose any harmful or embarrassing information of any participant and participants' views will remain anonymous as far as possible within the focus group. Teachers will be allocated numbers to ensure confidentiality and privacy.

Dissemination of findings

Transcripts of focus group interviews with teachers will be shared with them to be checked for accuracy.

Once the data have been analysed and interpreted an open invitation will be extended to all Grade 1 teachers of the participating schools, school principals, head of departments and parents of learners that participated in the project, to share the outcome with them.

If you have any further questions or enquiries regarding your participation in this research, please contact the researchers for more information.

DECLARATION BY SCHOOL GOVERNING BODY:

By signing below, I ……..……chairperson of the School

Governing Body of (school) _____ agree to take part in a research study entitled:

A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

I declare that:

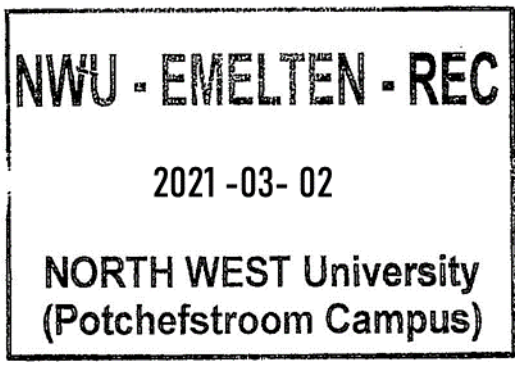
- I have read this information and consent form and understand what is expected of the school in the research.
- I have had a chance to ask questions to the researcher and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and the school has not been pressurised to take part.
- The school may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- The school may be asked to leave the research process before it has finished, if the researcher feels it is in the school's best interests, or if the school does not follow the research procedures, as agreed to.

Signed at Mankweng on (date) _____/_ _____ /2020

_____ _____

Signature of SGB chairperson **Signature of witness**

ANNEXURE C: PERMISSION FROM THE PRINCIPAL OF EACH SCHOOL TO CONDUCT THE RESEARCH STUDY IN THEIR SCHOOLS



NORTH-WEST UNIVERSITY ®
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School for Education Sciences

Dr Lynn Preston
Tel: 0182994765
Fax: 0182994238

THE PRINCIPAL

Name of School

Dear Sir/Madam

PERMISSION FROM THE SCHOOL PRINCIPAL

I herewith wish to request your permission for _____ Primary School to participate in this research study, which involves Grade 1 teachers from six primary schools in the Mankweng District. Before you give consent, please acquaint yourself with the information below.

The details of the research are as follows:

TITLE OF THE RESEARCH PROJECT:

A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

PROJECT SUPERVISOR: Dr LD Preston
CO-SUPERVISOR: Dr W van der Merwe

ADDRESS: Faculty Education Sciences
School of Education
Educational Psychology
NWU, Potchefstroom Campus

CONTACT NUMBER: 018 299 4765
MEMBER OF PROJECT TEAM: PhD-Student: Mrs René Annandale
ADDRESS: 13 Wilge Street, Flora Park, Polokwane, 0699
CONTACT NUMBER: 0741559397
e-mail address: reneannandale649@gmail.com

This study has been approved by the Ethics committee of the Faculty of Education Sciences of the North-West University, Reference number **NWU-02054-20-S2,** and will be conducted according to the ethical guidelines of this committee. Permission was also asked from the Department of Basic Education, as well as the school principal.

What is this research about?

The purpose of this research study is to fill the void in the CAPS document by compiling a pre-handwriting programme that will benefit learners inclusively, and use resources that are easily obtainable, if not everyday objects, to ensure accessibility for all Grade 1 learners and primary schools. An added advantage to a standardised pre-handwriting programme will be the uniform assessment of each learner against an appropriate age and developmental standard.

Participants

- Grade One teachers from six sub-urban schools.

What is expected of the school?

1. The researcher should be allowed to visit the Grade 1 teacher's classroom to observe one handwriting lesson.

2. The Grade 1 teachers will implement a pre-handwriting programme over a period of six weeks, between April 2021 and June 2021.

After the six-week period, the teachers will be required to identify difficulties and successes experienced regarding

- the time allocation,
- content,
- implementation,
- type of activities,
- resources and
- inclusive practices used in the pre-handwriting programme.

These aspects will be reported upon to the researcher during a focus group interview, where all the participating Grade 1 teachers will be present.

Should you agree to the research project taking place in your school, I will arrange with an independent person, Mrs Moloto, to visit your school at a convenient time in order to obtain consent from the Grade 1 teachers.

Mrs Moloto will return a week later to collect the completed consent forms, and to deliver a preliminary questionnaire to the participating teachers. She will also deliver letters of consent to be sent out to the learners' parents by the teachers, as well as a letter of assent, in order to obtain the learners' assent for the researcher to visit their classroom.

Benefits to your school by participating in this research

It is believed that the teachers as participants will benefit by becoming more aware of pre-

handwriting skills Grade 1 learners should master before embarking on formal handwriting instruction. The pre-handwriting programme will assist the teachers by providing activities that is aimed at the learners' development towards this end, and provide assessment criteria aimed at the developmental level of the learners.

The researcher will explain the pre-handwriting programme and demonstrate the activities to the teachers beforehand, and will be available for advice throughout the process.

Risks involved for participants

No risks are involved. Teaching and learning should continue as usual, with no special emphasis on the research project.

COVID-19 protocols

As legally mandated, everyone will wear masks and sanitize as required. Social distancing will be strictly adhered to as required by the school policy. The researcher will remain unobtrusive at the back of the classroom in her role as an observer. No interaction will take place with either the teacher or the learners during the observation lesson.

As the focus group interview will take place in the afternoon, after school hours, refreshments will be served. All Covid-19 protocols and procedures will be observed as required by the Department of Education. As legally mandated, the Grade 1 teachers and I will wear masks and sanitize our hands upon entering the venue. I shall sanitize the chairs beforehand by wiping them down with sanitizer containing 70% alcohol and disposable wipes. Social distancing will be strictly adhered to by placing the chairs 1,5m apart and the teachers will not be required to leave their chairs during the focus group interview. Please note that I will personally supply the sanitizer containing 70% alcohol and the disposable wipes.

Confidentiality and protection of identity

The researcher undertakes to not disclose any harmful or embarrassing information of any participant and participants' views will remain anonymous as far as possible within the focus group. Teachers will be allocated numbers to ensure confidentiality and privacy.

Dissemination of findings

Transcripts of focus group interviews with teachers will be shared with them to be checked for accuracy.

Once the data have been analysed and interpreted an open invitation will be extended to all Grade 1 teachers of the participating schools, school principals, Heads of Department and parents of learners that participated in the project, to share the outcome with them.

If you have any further questions or enquiries regarding your participation in this research, please contact me or the researcher for more information.

Thank you very much for considering this request. Will you please be so kind as to communicate the outcome of the request to me via e-mail. My e-mail address is: Lynn.Preston@nwu.ac.za

Kind regards.

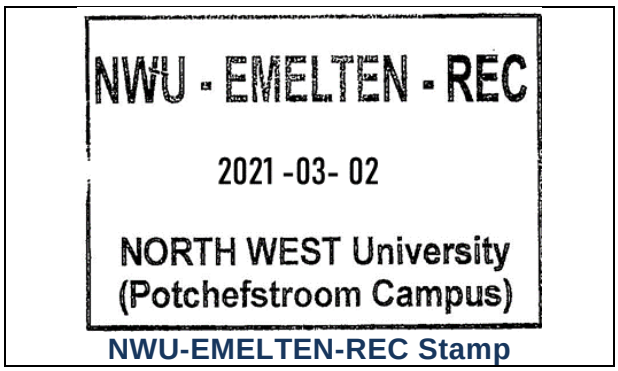
Dr Lynn Preston
Project Supervisor

ANNEXURE D: CONSENT FROM THE GRADE 1 TEACHERS FOR THEIR VOLUNTARY PARTICIPATION IN THIS RESEARCH STUDY

NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT
YUNIBESITI YA BOKONE-BOPHIRIMA

http://www.nwu.ac.za

The Faculty of Health Sciences Ethics Office of the North-West University is acknowledged for the use of their document with minor adjustments made by the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee (NWU-EMELTEN-REC).



NWU-EMELTEN-REC Stamp

INFORMED CONSENT DOCUMENTATION FOR GRADE 1 TEACHERS TO IMPLEMENT A PRE-HANDWRITING PROGRAMME IN THEIR CLASSROOMS FOR A PERIOD OF SIX (6) WEEKS

TITLE OF THE RESEARCH STUDY: A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

ETHICS REFERENCE NUMBER: NWU-02054-20-S2

PRINCIPAL INVESTIGATOR: Dr Lynn Preston

POSTGRADUATE STUDENT: Mrs René Annandale

ADDRESS: 13 Wilge Street, POLOKWANE, 0699

CONTACT NUMBER: 074 155 9397

You are invited to take part in a **research study** that forms part of a Doctoral study. Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee (NWU-02054-20-S2) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

1. What is this research study all about?

This study is an attempt to develop a pre-handwriting programme that may benefit learners inclusively, and use resources that are easily obtainable, everyday objects, to ensure accessibility for all Grade 1 learners and primary schools.

Such a standardised pre-handwriting programme will allow teachers to assess learners against an age appropriate and developmental standard. A standardised programme would help the Foundation Phase teacher when a learner is identified as experiencing fine motor difficulties. The teacher can decide whether to support the child in the classroom, or refer the learner to an occupational therapist.

We plan to discuss your teaching methods in teaching handwriting, and what you deem important when teaching handwriting. You will then be required to implement a pre-handwriting programme in your classroom over a period of six (6) weeks. At the end of the six-week period, all the Grade 1 teachers that took part in this study will come together and we shall discuss the success of the programme and difficulties encountered in the

implementation thereof.

This study will be conducted in the Grade 1 classrooms of six (6) primary schools in Mankweng, and will be done by an experienced researcher trained in Foundation Phase teaching. Six teacher participants and the Grade 1 learners in their classes will be included in this study.

2. Why have you been invited to participate?

You are invited to be part of this research because you are currently teaching Grade 1, and as a qualified Foundation Phase teacher, you are teaching handwriting in Grade 1.

You will unfortunately not be able to take part in this research if you are not currently a qualified Grade 1 teacher.

3. What will be expected of you*?*

You will be expected to:

Spend one hour on completing a questionnaire in writing.

Allow the researcher, Mrs Annandale, to spend the duration of one handwriting lesson in your classroom to observe your lesson. (No communication with either you or your learners will take place during the lesson, it will merely be for observation.)
You will be asked to meet with Mrs Annandale directly after school one afternoon for one hour, to receive the pre-handwriting programme, listen to the explanations of the instructions and activities, and to ask any questions you may have.

You will be required to implement the pre-handwriting programme in your classroom, during the normal time slots set aside for handwriting instruction, over a period of six (6) weeks. Please note that learners should not be taught “for the research project”. Teaching and learning in the Grade 1 classrooms should continue as usual.

Spend approximately two (2) hours in a focus group interview, bringing your observations and thoughts to the table and interacting with the researcher and Grade 1 teachers from five other schools that have also participated in the research study. The focus group interview will take place at a school in Mankweng, one afternoon after school.

4. Will you gain anything from taking part in this research?

The gains for you if you take part in this study will be that you will be able to successfully prepare Grade 1 learners to undergo formal handwriting instruction. The aim is that the programme will lessen or eliminate possible perceptual difficulties that could possibly have caused barriers to learning in your young learners.

5. Are there risks involved in you taking part in this research and what will be done to prevent them?

Risks	**Precautions**
No foreseeable risks are identified, as no strenuous activity will be expected from the teachers, or the observed learners.	During the observations, the learners will be continuing with their usual daily handwriting classes, which is expected of them in their daily routines in the classroom.
COVID-19	As legally mandated, everyone will wear masks and sanitise as required. Social distancing will be strictly adhered to as required by the school policy. The researcher will remain unobtrusive at the back of the classroom in her role as an observer. No interaction will take place with either the teacher or the learners during the lesson.
During the implementation of the pre-handwriting programme there are also no foreseeable risks. Activities that are envisaged are finger exercises, everyday eye-hand coordination activities and other handwriting exercises that can be done at the learner's desks and many are part of the usual hand writing exercises that teachers normally provide for the learners.	It is important that you do not teach "for the research project". No mention should be made of the research project, with the learners being instructed as usual. School and classroom teaching should be "*business-as-usua*l". The pre-handwriting exercises should be experienced by the

	learners as part of everyday instruction in their classroom environment.

6. How will we protect your confidentiality and who will see your data?

Anonymity of your data will be protected by replacing your name on the questionnaire and in the transcripts of the focus group discussion with a pseudo name, e.g., Teacher A. Your privacy will be respected by not sharing information that might embarrass you, or show you in a negative light. Information will not be shared with anyone without your written consent.

Your results will be kept confidential by storing data such as the audio recording from the focus group interview electronically, and it will be password protected by the researcher. Questionnaires, letters of consent, transcriptions of the audio recording and field notes will be stored by the researcher in a keyword, keypad-protected safe in a building with a sensor-fitted alarm system in each room. After the study has been finalized, electronic and hard copy data will be stored by the principal investigator on her password protected computer, and in a locked cabinet in her office.

Only the researcher and the researcher's promotors at North-West University will be able to look at your data. Data will be kept safe by locking hard copies away in locked cupboards in the researcher's office and electronic data will be password protected. As soon as data the data from the audio recording of the focus group interview has been transcribed it will be deleted from the recorders. Data will be stored for five (5) years.

7. What will happen with the data or samples?

The data of this study will be used for this study only.

8. How will you know about the results of this research?

We will give you the results of this research once the thesis had been approved by the examining bodies.

You will receive a hard copy of an executive summary of the study, and I will avail myself for further explanations.

9. Will you be paid to take part in this study and are there any costs for you?

This study is funded by the researcher, Mrs René Annandale, personally. No outside sponsorship has been obtained for this study.

Travel expenses will be paid if you have to travel to the school hall where the focus group discussion will be held, and back to your own school again. This will be a cash payment and you will be asked to sign a cash slip when the money is paid to you.

Refreshments will be served when all the Grade 1 teachers that participated in this study meet for the focus group discussion at the end of the 6-week implementation period of the pre-handwriting programme.

There will thus be no costs involved for you, if you do take part in this study.

Is there anything else that you should know or do?

- You can contact Mrs René Annandale on 0741559397 or reneannandale@telkomsa.net if you have any further questions or have any problems.
- You can also contact the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee via Mrs Villera le Roux at 018 299 4707 or villera.leroux@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.
- You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I …….…… agree to take part in the research study titled: *A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom.*

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at Mankweng on (*date*) ……..……..…….. 2021.

Signature of participant Signature of witness

2.3.1 Declaration by person obtaining consent

I*, name of gatekeeper*, declare that:

- I clearly and in detail explained the information in this document to

  …….
- I did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above

- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at Mankweng on (*date*) ……..……..…….. 2021.

Signature of person obtaining consent

Declaration by researcher

I, René Annandale, declare that:

- I had the information explained by *name of gatekeeper*, who I trained for this purpose.
- I did not use an interpreter. I was available should the teacher want to ask any further questions.
- The informed consent was obtained by an independent person.
- I am satisfied that the teacher adequately understands all aspects of the research, as described above.
- I am satisfied that the teacher has had time to discuss it with others if he/she wished to do so.

Signed at Mankweng on (*date*) ……..……..…….. 2021.

Signature of researcher

ANNEXURE E: CONSENT FROM THE PARENTS OF THE GRADE 1 LEARNERS THAT PARTICIPATED IN THIS RESEARCH STUDY

Private Bag X1290, Potchefstroom
South Africa 2520
Tel: +2718 299-1111/2222
Fax: +2718 299-4910
Web: http://www.nwu.ac.za

The Faculty of Health Sciences Ethics Office of the North-West University is acknowledged for the use of their document with minor adjustments made by the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee (NWU-EMELTEN-REC).

NWU - EMELTEN - REC
2021-03-11
NORTH WEST University
(Potchefstroom Campus)

INFORMED CONSENT DOCUMENTATION FOR GRADE 1 LEARNERS TO PARTICIPATE IN A PRE-HANDWRITING PROGRAMME IN THEIR CLASSROOMS FOR A PERIOD OF SIX (6) WEEKS

TITLE OF THE RESEARCH STUDY: A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

ETHICS REFERENCE NUMBERS: NWU-02054-20-S2
PRINCIPAL INVESTIGATOR: Mrs René Annandale
POSTGRADUATE STUDENT: Mrs René Annandale
ADDRESS: 13 Wilge Street, POLOKWANE, 0699
CONTACT NUMBER: 0741559357

Your child is invited to take part in a **research study** that forms part of a Doctoral study. Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or your child's teacher any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how your child might be involved. Also, your child's participation is **entirely voluntary** and he/she is free to say no to participate. If your child says no, this will not affect him/her negatively in any way whatsoever. Your child is also free to withdraw from the study at any point, even if he/she does agree to take part now.

This study has been approved by the **North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee (NWU-02054-20-S2)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

- This study aims to develop a pre-handwriting programme that may benefit all Grade 1 learners and primary schools. It will be a uniform programme that will help in the development of fine motor muscles in the hands of learners, enabling them to write easily and neatly, cut evenly with scissors, dress themselves with confidence, and handle eating utensils.
- The researcher will visit your child's classroom for the duration of one handwriting lesson. The researcher will not speak to your child, and your child will not be identified in any way. The purpose of the visit to the classroom is to observe the teacher's method in teaching handwriting.

Why has your child been invited to participate?

- Your child is invited to be part of this research because he/she is currently in Grade 1 and learning to write by forming letters and numbers correctly.

What will be expected of your child?
Your child will receive fifteen (15) minutes of instruction in fine motor development every school day, for six (6) weeks. This instruction will take place in the time slot set aside for handwriting instruction each morning, that is, during regular classroom activities. If you do not want your child to participate, an alternate activity will be available. The alternate activity will be to colour in a picture for the 15 minutes his/her classmates will be doing the fine motor exercises.

Will your child gain anything from taking part in this research?
Your child will benefit from improved fine motor skills, which will enable him/her to hold a pencil correctly and form numbers and letters smoothly, enabling him/her to write with fluency and ease. Fine motor skills are also important in self-care, that is, when dressing himself/herself, and in using a knife and fork when eating.

Are there risks involved in you taking part in this research and what will be done to prevent them?

Risks	Precautions
No foreseeable risks are identified, as no strenuous activity will be expected from the teachers, or the observed learners. Covid 19 During the implementation of the pre-handwriting programme there are also no foreseeable risks. Activities that are envisaged are finger exercises, everyday eye-hand coordination activities and other handwriting exercises that can be done at the learner's desks and many are part of the usual hand writing exercises that teachers normally provide for the learners.	During the observations, the learners will be continuing with their usual daily handwriting classes, which is expected of them in their daily routines in the classroom. As legally mandated, everyone will wear masks and sanitise as required. Social distancing will be strictly adhered to as required by the school policy. The pre-handwriting exercises will be experienced by your child as part of everyday instruction in his/her classroom environment.

Will your child be paid to take part in this study and are there any costs for you?

Your child will not be paid to take part in this study. This study will take place during the normal handwriting period in the classroom, and therefore there will be no cost involved to you.

Is there anything else that you should know or do?

- You can contact Mrs René Annandale on 0741559397 or reneannandale@telkomsa.net if you have any further questions or have any problems.
- You can also contact the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee via Mrs Villera le Roux at 018 299 4707 or villera.leroux@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

Declaration by parent

By signing below, I (name and surname of parent) _____

agree for my child (name and surname of child)

to take part in the research study titled: *A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom.*

I declare that:

- I have read this information.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that my child will be taking part in this study **voluntarily** and my child has not been pressurised to take part.
- My child may choose to leave the study at any time and will not be handled in a negative way if he/she does so.

Signed at (place) _____ on (date) _____. 2021.

Signature of parent	**Signature of witness**
Name of parent	Name of witness

Declaration by person obtaining consent

I, (teacher) _____, declare that:

- I clearly and in detail explained the information in this document to the parent/guardian.
- I did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at Mankwena on (date) _____. 2021.

.....

Signature of teacher obtaining consent

ANNEXURE F: ASSENT FROM THE GRADE 1 LEARNERS FOR THE RESEARCHER TO OBSERVE A HANDWRITING LESSON IN THEIR CLASSROOM

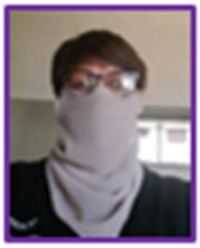
NWU - EMELTEN - REC
2021 -03- 02
NORTH WEST University
(Potchefstroom Campus)

Dear Grade 1 learners

I am Teacher René  and I would love to come and visit your classroom one morning.

I want to sit in your classroom for a short while and see how your teacher teaches you to write.

Will you allow me to come to your classroom, please?

I promise to be good while I am in your classroom and I promise to wear my mask. 

Please tell your teacher by showing your thumb:

	
Yes	No

ANNEXURE G: ETHICAL CLEARANCE OBTAINED FROM THE NORTH-WEST UNIVERSITY TO CONDUCT THIS STUDY

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: +2718 299-1111/2222
Web: http://www.nwu.ac.za

North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Office (NWU-EMELTEN-REC)

Tel: +2718 299 4707
Email: lukas.meyer@nwu.ac.za

27 September 2021

Dear Dr Preston

FEEDBACK ON APPLICATION FOR AMENDMENTS TO AN APPROVED RESEARCH ETHICS PROTOCOL

ETHICS NUMBER: NWU-02054-20-A2

Study title: A Grade 1 pre-handwriting programme to promote inclusive practices in the classroom

Study leader/supervisor: Dr Lynn Preston

Student: Ms. R Annandale

Application type: Single study

Risk levels: Minimal

The above-mentioned application for amendments to the above-mentioned study, has been reviewed and approved and the approval will be formally ratified at the NWU-EMELTEN-REC meeting to be held on 18 October 2021.

Should you have any further queries, please feel free to contact Ms Villera le Roux at your earliest convenience (E-mail: Ethics-EMELTEN-process@nwu.ac.za ; Tel: 018 299 4707).

We wish you well in your future research endeavours.

Yours sincerely,

Chairperson NWU-EMELTEN-REC
Prof Lukas Meyer

ANNEXURE H: ETHICAL CLEARANCE OBTAINED FROM THE DEPARTMENT OF EDUCATION TO CONDUCT THIS STUDY

CONFIDENTIAL

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE PREMIER

Office of the Premier

Research and Development Directorate

Private Bag X9483, Polokwane, 0700, South Africa

Tel: (015) 230 9810, Email: mokobj@premier.limpopo.gov.za

LIMPOPO PROVINCIAL RESEARCH ETHICS

COMMITTEE CLEARANCE CERTIFICATE

Meeting: **April 2021**

Project Number: LPREC/29/2021: PG

Subject: A Grade 1 Pre-Handwriting Programme to Promote Inclusive Practices in the Classrooms

Researcher: Annandale R

Dr Thembinkosi Mabila

Chairperson: Limpopo Provincial Research Ethics Committee

The Limpopo Provincial Research Ethics Committee (LPREC) is registered with National Health Research Council (NHREC) Registration Number **REC-111513-038.**

Note:

i. **This study is categorized as a Low Risk Level in accordance with risk level descriptors as enshrined in LPREC Standard Operating Procedures (SOPs)**

ii. **Should there be any amendment to the approved research proposal; the researcher(s) must re-submit the proposal to the ethics committee for review prior data collection.**

iii. **The researcher(s) must provide annual reporting to the committee as well as the relevant department and also provide the department with the final report/thesis.**

iv. **The ethical clearance certificate is valid for 12 months. Should the need to extend the period for data collection arise then the researcher should renew the certificate through LPREC secretariat. PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRIES.**

ANNEXURE I: AGREEMENT BETWEEN THE GATEKEEPER AND THE RESEARCHER

AGREEMENT OF CONFIDENTIALITY WITH INDEPENDENT PERSON

CONFIDENTIALITY UNDERTAKING

entered into between:

I, the undersigned

Name of gatekeeper

hereby undertake in favour of the **NORTH-WEST UNIVERSITY**, a public higher education institution established in terms of the Higher Education Act No. 101 of 1997

Address: Office of the Institutional Registrar, Building C1, 53 Borcherd Street, Potchefstroom, 2520

(hereinafter the “NWU”)

1 Interpretation and definitions

1.1 In this undertaking, unless inconsistent with, or otherwise indicated by the context:

1.1.1 “Confidential Information” shall include all information that is confidential in its nature or marked as confidential and shall include any existing and new information obtained by me after the Commencement Date, including but not be limited in its interpretation to, research data, information concerning research participants, all secret knowledge, technical information and specifications, manufacturing techniques, designs, diagrams, instruction manuals, blueprints, electronic artwork, samples, devices, demonstrations, formulae, know-how, intellectual property, information concerning materials, marketing and business information generally, financial information that may include remuneration detail, pay slips, information relating to human capital and employment contract, employment conditions, ledgers, income and expenditures and other materials of whatever description in which the NWU has an interest in being kept confidential; and

1.1.2 “Commencement Date” means the date of signature of this undertaking by myself.

1.2 The headings of clauses are intended for convenience only and shall not affect the interpretation of this undertaking.

2 Preamble

2.1 In performing certain duties requested by the NWU, I will have access to certain Confidential Information provided by the NWU in order to perform the said duties and I agree that it must be kept confidential.

2.2 The NWU has agreed to disclose certain of this Confidential Information and other information to me subject to me agreeing to the terms of confidentiality set out herein.

3 Title to the Confidential Information

I hereby acknowledge that all right, title and interest in and to the Confidential Information vests in the NWU and that I will have no claim of any nature in and to the Confidential Information.

4 Period of confidentiality

The provisions of this undertaking shall begin on the Commencement Date and remain in force indefinitely.

5 Non-disclosure and undertakings

I undertake:

5.1 to maintain the confidentiality of any Confidential Information to which I shall be allowed access by the NWU, whether before or after the Commencement Date of this undertaking. I will not divulge or permit to be divulged to any person any aspect of such Confidential Information otherwise than may be allowed in terms of this undertaking;

5.2 to take all such steps as may be necessary to prevent the Confidential Information falling into the hands of an unauthorised third party;

5.3 not to make use of any of the Confidential Information in the development, manufacture, marketing and/or sale of any goods;

5.4 not to use any research data for publication purposes;

5.5 not to use or disclose or attempt to use or disclose the Confidential Information for any purpose other than performing research purposes only and includes questionnaires, interviews with participants, data gathering, data analysis and personal information of participants/research subjects;

5.6 not to use or attempt to use the Confidential Information in any manner which will cause or be likely to cause injury or loss to a research participant or the NWU; and

5.7 that all documentation furnished to me by the NWU pursuant to this undertaking will remain the property of the NWU and upon the request of the NWU will be returned to the

NWU. I shall not make copies of any such documentation without the prior written consent of the NWU.

6 Exception

The above undertakings by myself shall not apply to Confidential Information which I am compelled to disclose in terms of a court order.

7 Jurisdiction

This undertaking shall be governed by South African law be subject to the jurisdiction of South African courts in respect of any dispute flowing from this undertaking.

8 Whole agreement

8.1 This document constitutes the whole of this undertaking to the exclusion of all else.

8.2 No amendment, alteration, addition, variation or consensual cancellation of this undertaking will be valid unless in writing and signed by me and the NWU.

Dated at Mankweng this 6th day of March 2021.

Witnesses:

1

2

(*Signatures of witnesses*) (*Signature*)

ANNEXURE J: QUESTIONNAIRE HANDED OUT TO THE TEACHERS

QUESTIONNAIRE COMPLETED BY THE GRADE 1 TEACHERS AT THE BEGINNING OF THE STUDY

THE TEACHER
1.Are you a qualified Foundation Phase teacher?
2.How long have you been teaching in the Foundation Phase?
3.How long have you been teaching Grade 1?
4.What is your view on teaching handwriting? (Do you see it as an important part of learning, is it easy to teach handwriting, should handwriting be taught formally in Grade 1? etc.)
5.Name difficulties you experience as a teacher, in teaching handwriting at Grade 1 level.
6. Name difficulties experienced most often by Grade 1 learners in handwriting.
7.How do you address the difficulties experienced by the learners in handwriting.

THE ENVIRONMENT/EQUIPMENT
8.Are writing materials such as books, pencil and crayons provided by the Department of Education, the school and/or the parents?
9.Do you have any input in the type of writing materials you would like your learners to have? Would you prefer specific writing materials, or are you satisfied with what the learners receive/bring?
10. Indicate the equipment in your classroom for teaching handwriting

	Blackboard		Individual blackboards for the learners, with chalk
	Chalk		Individual write & wipe boards for the learners, with whiteboard markers
	Whiteboard		Sandpaper letters, or the equivalent thereof
	Whiteboard markers		Sand trays, or the equivalent thereof
	Interactive whiteboard		Handwriting charts on the learners' desks

ANNEXURE K: OBSERVATION CHECKLIST USED BY THE RESEARCHER DURING CLASSROOM VISITS FOR THE OBSERVATION OF ONE HANDWRITING LESSON

THE TEACHER		
	Seems confident	
	Teaches with patience	
	Keeps record of difficulties experienced by learners (observation book)	
	Has intervention strategies at the ready	
	Asks for assistance when needed (e.g. HOD, colleague, OT)	
THE LESSON		
	Attention grabber used	
	Finger and hand warm-up is done	
	Logical flow to the lesson	
	Letter formation described in a rhyme	
	Learners write in the air, on boards, in books, in clay, on unlined paper, etc.	
	Concrete materials used	
THE LEARNERS		
	Show interest in the lesson	
	Seemingly the way the lesson is usually presented	
	Eager to participate	
	Learners have stationery needed	
	Writing tool for today's lesson	
	Workbooks: feint and margin Irish lines	
	Learners with special needs present	
	Learners with special needs accommodated	
	Intervention strategies evident	

	Outcome of intervention strategies	
	Intervention strategies befit the difficulties experienced by the learner	
THE ENVIRONMENT		
	Size of the classroom	
	Lighting	
	Desk sizes are appropriate	

Range: * Excellent √ Good ° Average x Poor

ANNEXURE L: COVID-19 PROTOCOL SHEET, AS REFERRED TO IN SECTION 3.12.1

COVID-19 PROTOCOL FOR THIS STUDY

Upon arrival at the schools, the signing in protocol at the gate was followed, which included wearing a mask, temperature measurement, sanitizing of hands and providing personal information such as name, contact details and purpose of the visit.

During classroom observations, teachers were greeted by the touching of elbows and the learners were greeted with the wave of a hand in the air. Teachers and learners wore masks permanently. Teachers had sanitizing spray available on their own desks, and this was used frequently by the teachers and the learners. The researcher wore a mask, took her own sanitizer along and was seated in the back of the classroom, at least 2 metres from the nearest learner.

Schools were following a rotational system, which allowed a limited number of learners in the classroom per day for the sake of social distancing.

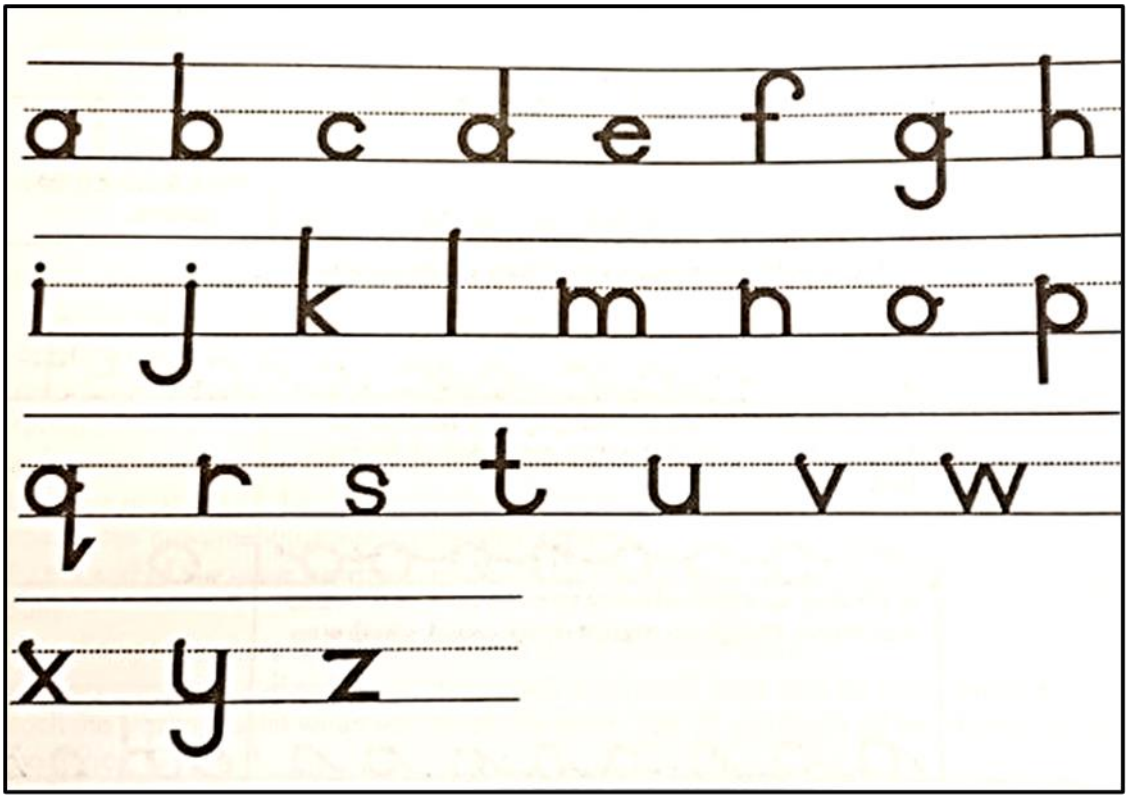
During the focus group discussions, Covid 19- protocols were strictly adhered to by way of wearing masks, sanitizing and social distancing. I personally wiped down all the chairs with sanitizing wipes before placing them in a circle (See Photograph 1). Refreshments were prepared for the first focus group discussion, as seen in Photograph 2, and served as individually wrapped muffins, sealed cans of juice and bottles of water. A sanitizing station was placed at the entrance to the venue, as shown in Photograph 3.

Photograph 1: Sanitised chairs in readiness of the focus group discussion

Photograph 2: Individually wrapped refreshments, sealed cans of juice and individual bottles of water in readiness of the focus group discussion

Photograph 3: The sanitising station placed at the door of the venue to the focus group discussion

ANNEXURE M: STANDARD LOWER CASE LETTER FORMATION, ACCORDING TO THE ZANER-BLOSER HANDWRITING METHOD, WITH THE STARTING POINT INDICATED FOR EACH LETTER, AS PRESCRIBED BY THE DEPARTMENT OF BASIC EDUCATION

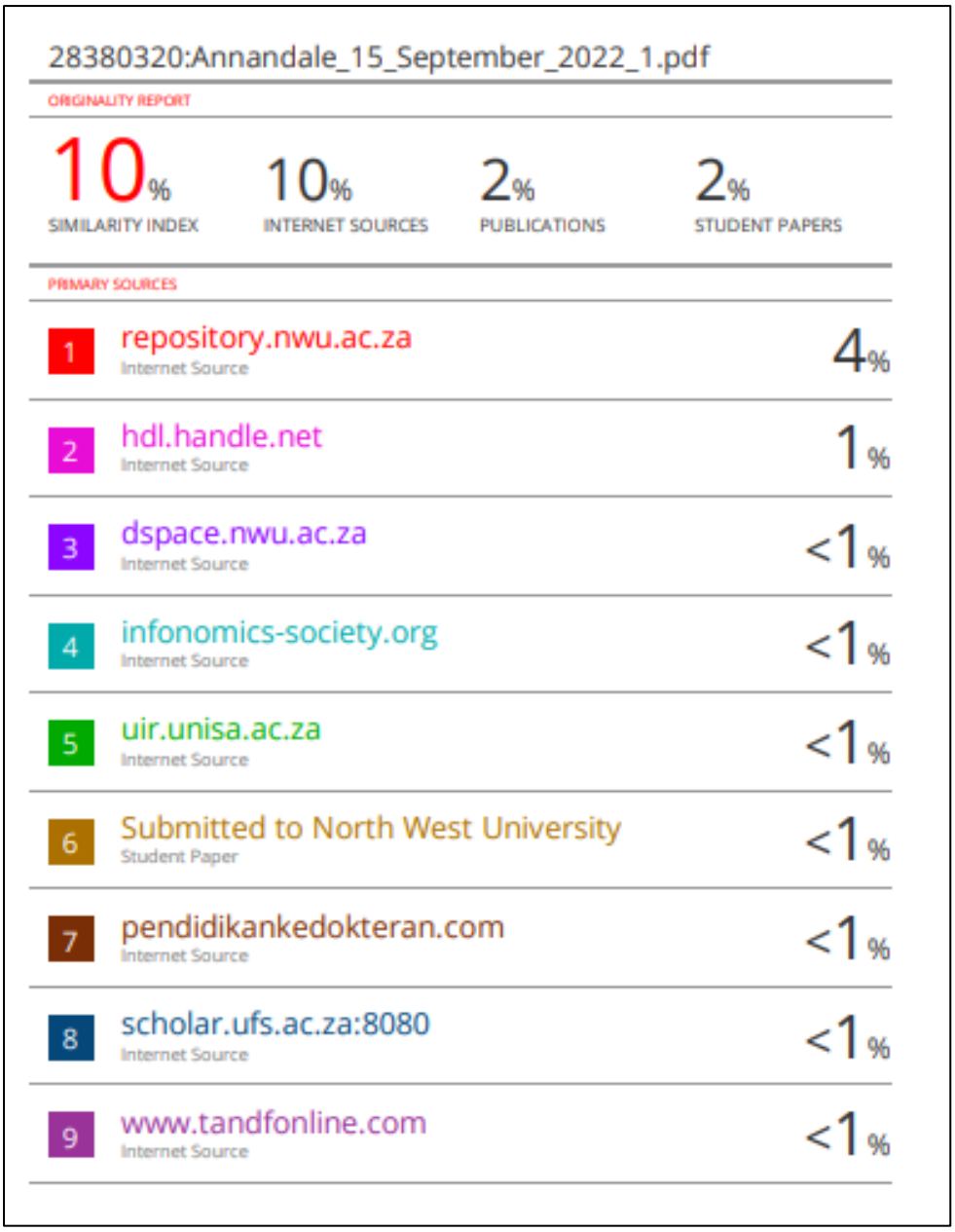


ANNEXURE N: GUIDELINE QUESTIONS USED IN THE FOCUS GROUP DISCUSSIONS

The guidelines were:

- What general challenges did you as Grade 1 teacher experience with the implementation of the pre-handwriting programme?
- Are there any other experiences that you think are noteworthy regarding the pre-handwriting programme or the implementation thereof?
- What strategies did you use when you noted that a Grade 1 learner struggled to master the activities prescribed in the pre-handwriting programme?

ANNEXURE O: TURNITIN REPORT



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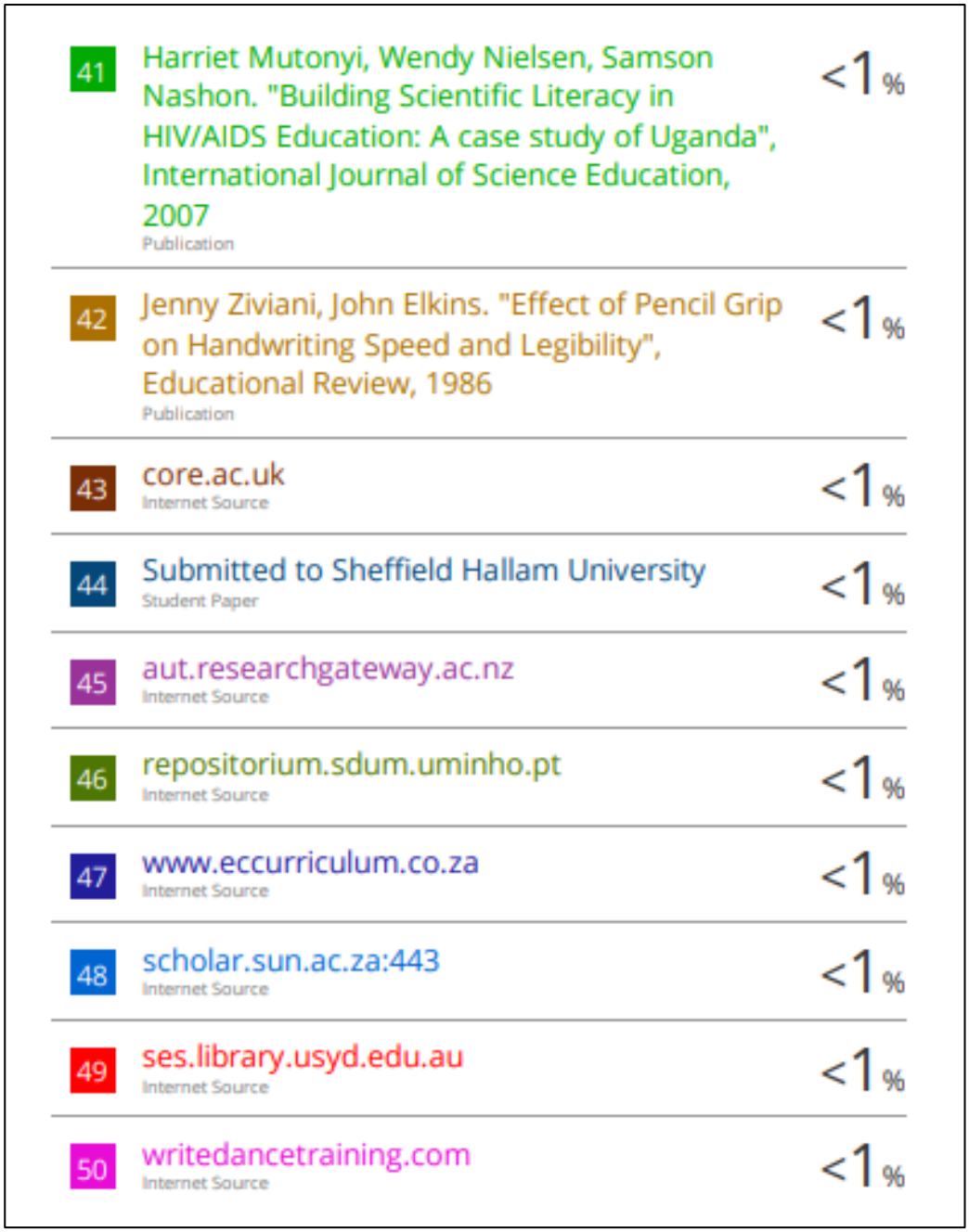
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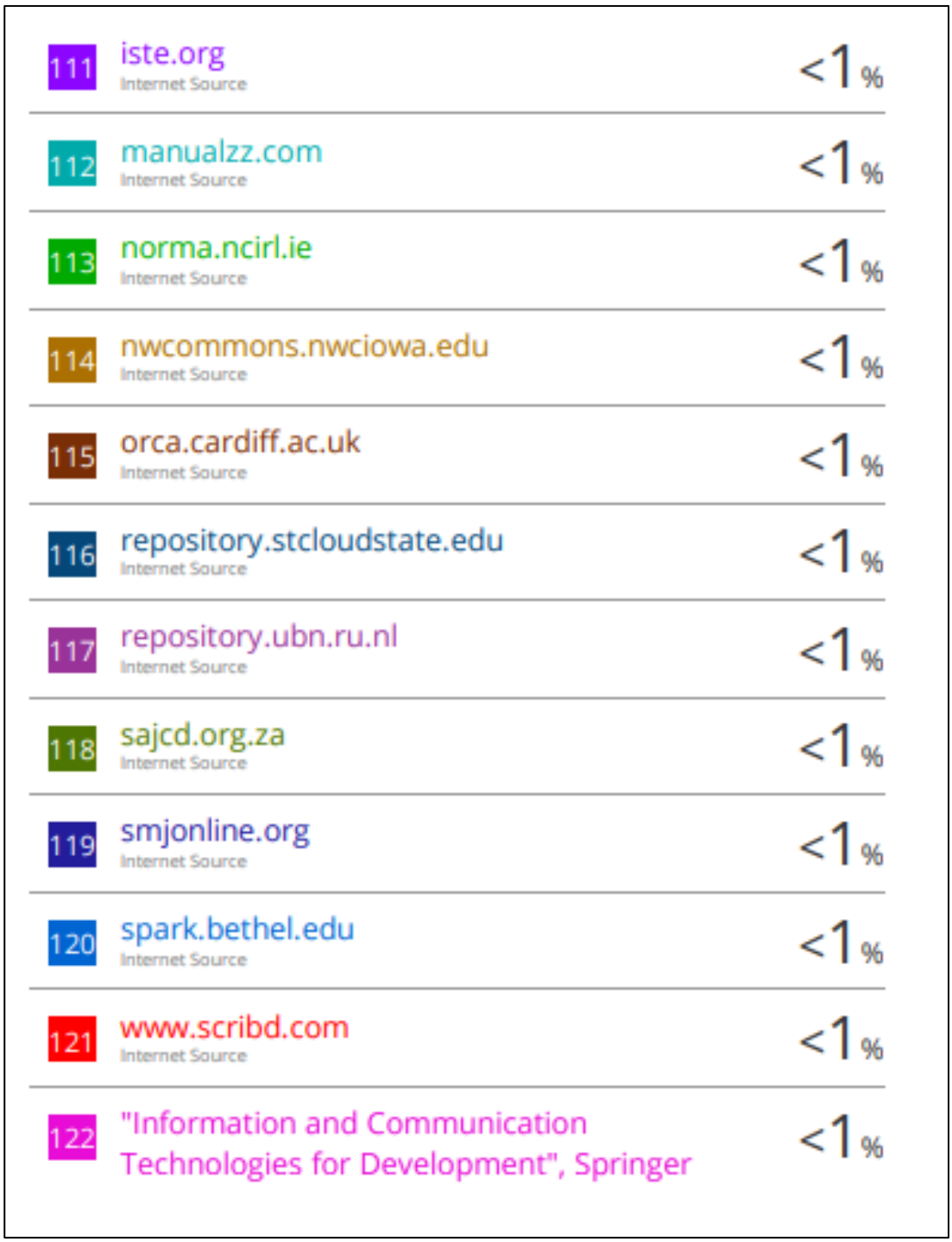
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EDITING

31 August 2022

To whom it may concern

This letter serves to confirm that the following thesis was edited:

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ANNEXURE Q: QUALITY CONTROL: REFERENCING PROTOCOL

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QUALITY CONTROL: REFERENCING PROTOCOL

To whom it may concern

I, Elsa Maria Esterhuizen, hereby declare that the quality control of the referencing style according to the NWU Harvard guidelines, as used in the dissertation submitted in fulfilment of the requirements for the degree *Doctor of Philosophy (Special Needs Education)* at the North-West University

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was conducted and completed on 02 September 2022.

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(B.A., UED., HLD., M.Ed. (Educational Technology)