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**THE NATIONAL UNIVERSITY OF IRELAND
MAYNOOTH**

Froebel Department of Primary and Early Childhood Education

**M.Ed. (Research in Practice)
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AN EXPLORATION INTO THE TEACHING OF HANDWRITING WITH FIRST

CLASS PUPILS

Aoife Eimear Daly

A Research Dissertation submitted to the Froebel Department of Primary and Early Childhood Education, Maynooth University, in fulfilment of the requirements for the degree of Master of Education (Research in Practice)

September 2019

Supervised by: Eddie Costello

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Abstract

This action research project was conducted in a co-educational, rural school with 30 first class pupils aged between 6 and 7 years.

The research question was '*How can I provide a more enriching experience for students when I am teaching handwriting?*' This area was chosen for research as I was concerned that I was using a didactic, teacher-led approach to teaching handwriting and this was not assisting the children with their handwriting skills. I was also not living out to my value of fairness by teaching in this way.

The aim of the study was to find answers to the following questions:

- *What is the best way to teach this in the context of my own classroom?*
- *How can I make handwriting more interesting for pupils in my classroom?*
- *How to enhance my own understanding and knowledge of handwriting and the required skills in teaching this area*

Data for this study was collected using observations, children's work samples, a reflective journal and conversations with critical friends. There were two cycles of action research, lasting four weeks each. The research took place between January and April 2019. The research cycles primarily focused on (1) environment (2) the introduction of fine and gross motor skills and (3) explicit handwriting instruction.

The results of the research demonstrated the importance of allowing opportunities for creativity in the classroom. The importance of establishing a supportive environment was also highlighted, in addition to a child-centred approach using active methodologies to teach handwriting.

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I thank the children in my class for participating in the research and for sharing their contributions in order to help me to live closer to my values.

I wish to show appreciation to all who took part in the research process. Their cooperation provided me with valuable insights for my research.

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List of Abbreviations

DEE   Department of Education England

DEECD   Department of Education and Early Childhood Development

DES   Department of Education and Skills

ICT   Information Communication Technology

NCCA   National Council for Curriculum and Assessment

NHS   National Health Service

PISA   Programme for International Student Assessment

SEN   Special Educational Needs

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1   Chapter One

Introduction

1.1   Introduction to Study

This is an action research study which aims to explore educational practice in the area of handwriting. Chapter one will provide an outline of the reasons for choosing to study this area. I will address the research question and the aims of the research in this chapter. Additionally, I will discuss the intervention I implemented in my classroom. The structure of the paper will also be outlined.

1.2   Focus and Aims of the Study

1.2.1   The Need for Handwriting

Children are often required to write for the majority of the school day (DEECD, 2012). Cutler and Graham (2008) estimate that children spend approximately one hour of their school day writing. Considering children spend a large amount of the school day writing, it is important that adequate handwriting instruction is delivered. It is interesting to note that if struggling handwriters are in an unsupportive environment, handwriting will become a difficult, laborious activity. Research carried out in Ireland by Howard (2019) into the teaching and learning of handwriting and fine motor skills of left-handed pupils highlighted that 43% of participants in the survey stated they did not receive training in handwriting and fine motor skills. This highlights the importance of creating a supportive environment for children when they are learning to write. Wray et al. (2002) believe that handwriting is not held in the same regard as other areas of literacy. This may be due to the fact that there is no standardised test for handwriting. Berliner (2011) argues that

standardised testing can result in a narrowing of the curriculum. A survey carried out by Graham et al. (2008) to examine instructional practices of handwriting in the USA indicated that only 12% of teachers felt they received adequate training to teach handwriting. Howard's (2019) study outlined that 70% of teachers never participated in professional development for handwriting skills. This suggests a need for more professional development for teachers in this area.

1.2.2   My Research Question

I set out to address the following question at the beginning of my study:

How can I provide a more enriching experience to students when I am teaching handwriting?

By the term 'enriching' I mean making things more interesting for pupils. I wanted to make my practice more worthwhile and ensure what I was doing was not only helping the children with their handwriting, but that they were also interested and enjoyed practising it.

From this research question, I also had other questions which became the aims of the action research study:

- *How to enhance my own understanding and knowledge of handwriting and the required skills in teaching this area*
- *What is the best way to teach this in the context of my own classroom?*
- *How can I make handwriting more interesting for pupils in my classroom?*

1.3   Research Background, Context and Intervention

1.3.1   Relevance of the research on a personal level

My primary school education saw the introduction of the 1999 Curriculum. The general principles of this curriculum included celebrating the uniqueness of the child and the

development of the child's full potential (NCCA, 1999: 8). In addition to this, three main pedagogical principles were introduced. These included activity and discovery based methods, and integrated curriculum and environment-based learning.

However, despite the introduction of this new curriculum, I still experienced many didactic ways of teaching. For example, the class was regularly assigned work from textbooks and concrete materials were not a regular feature of the lessons. However, one teacher in particular stands out as embracing this 'new' curriculum at the time and taught in a way that influences my own teaching today. It was evident that this teacher valued the environment, and many of her lessons were focused on our immediate surroundings. Also, this teacher valued the use of games and play in her lessons, despite us being a senior class. This had a significant effect on me as a learner, as I enjoyed school and found lessons interesting.

I started my first teaching role in a school in September 2015. Although there was an existing handwriting policy in this school it was also evident from the school culture that handwriting was valued. I believe this has shaped my view on the importance of handwriting. Despite implementing this handwriting policy in my classroom, I did not feel that the children's handwriting was improving. I started to question the way I was teaching. This policy provided a guide for me but I was teaching in a didactic way which was not working for the children.

Through reflection, I started to question why I was teaching handwriting in a didactic style, while applying different methodologies to other areas of my teaching. I was not teaching in line with the principles of the curriculum and also not working in line with the values I held as a Froebelian teacher. Prior to starting this research, the only item I had to help with handwriting was an alphabet frieze. I was teaching one handwriting lesson a week. For handwriting lessons, I was modelling the letter on the board and the children would write it

into their handwriting books. This didactic approach I was using was what Freire (1970) described as the 'banking method'.

Lortie (1975) makes reference to the apprenticeship of observation which means educators using personal experiences from their own schooling to teach, despite knowing other methodologies. I realised that I was teaching based on my own experience in primary school. Additionally, instead of starting where the children were at with their handwriting, I was following the pre-determined scheme of the handwriting book. I was not incorporating my value of a child-centred approach in my teaching and I also felt obliged to have the book completed for parents by the end of the year.

Last year in my role as a special education teacher, I observed many children struggling with handwriting. Often, children had great ideas but struggled with the written communication of these ideas, as they found handwriting difficult or found it hard to write quickly. In addition to this, sometimes I found it hard to read children's work due to poor legibility. I therefore started thinking about how often we as teachers expect students to write across the curriculum and how often handwriting is taught in the classroom.

1.3.2   Relevance of research to wider educational context:

When I graduated from initial teacher education, teachers were guided by the 1999 English curriculum (NCCA, 1999). This has been recently replaced by the 2015 primary language curriculum (NCCA, 2015). A brief comparison between the two may partly explain my reason for a didactic style. In the 1999 English curriculum, there is very little guidance as to how to approach the teaching of handwriting. This might explain one of the reasons why I used a didactic style for teaching. I was enacting my own experience from primary school. However, the 2015 primary language curriculum provides more guidance and support material for teaching handwriting. It is clear that now policy makers are

recognising the importance of this area and there is now more of an emphasis on the teaching of handwriting.

1.3.3   My Values

According to Berkowitz (1995), values are articulated in our behaviour and attitudes. Gudmundsdottir (1990) also shares this view, stating that teachers' values are echoed in their actions. It is my value of care that encouraged me to embark on this journey of self-study action research. According to Noddings (2012), natural caring occurs in schools. I value fairness but realised I was not being fair in aspects of my practice. I identified a concern in my practice and wished to make change in order improve my teaching and my students' learning.

While it is important for educators to be aware of their values, it is also important to be critical and to reflect on values. This is so that different perspectives can be taken into account (Veugelers and Vedder, 2003). When I made the decision to do this research study, I had to identify my values and check if I was living in line with the values I held. I had to be open to criticism and change in order to do this.

When I was in primary school, I had a teacher that inspired me. This teacher provided many opportunities to allow the children in her classroom to embrace their creative side. It was clear this teacher valued creativity and this was apparent in the classroom environment. I aspire to provide similar opportunities in my own classroom after the positive experiences and memories I have of this classroom.

I now recognise the importance of identifying my values so these are manifested in my classroom. My teacher education was based on the principles of educator Friedrich Froebel. Froebel (1886) believed in the uniqueness and holistic development of every child. In addition to this, he saw creativity and play as central components in a child's development. Many of Froebel's beliefs underpin the aims of the primary school

curriculum (NCCA, 1999) as mentioned in section 1.2.1. I strive to create a classroom that is in line with my Froebelian values.

1.3.4   The Intervention

The intervention took place with first class pupils in a rural school between January and April 2019, consisting of two research cycles. I will describe the details of the intervention in greater detail in chapter three. The intervention was designed to enhance my overall approach to handwriting in the classroom, using an action research approach. It was implemented each day throughout the two research cycles. During the first round of action research there were three key aspects to the intervention. These comprised of (1) the introduction of fine and gross motor skills (2) the environment and (3) changes to the explicit instruction of handwriting. Adaptations were made within these areas for action research cycle two.

1.4   Potential Contribution of the Study

The primary language curriculum (NCCA, 2015) has highlighted the importance and need for handwriting. This is because in the strand on 'writing' in the curriculum for all class groups, there is a specific learning outcome for handwriting. Also, supporting material for teachers is now provided to assist with the implementation of handwriting in the classroom. However, I believe there is still a need for more professional development for teachers in this area so that teachers are confident teaching handwriting in the classroom. I hope that by sharing my experience of this study with other educators, I can provide ideas and share my knowledge in the area.

1.5   Format of the Study

This thesis comprises of five chapters.

Chapter one outlines my rationale for choosing the area of research, in addition to identifying my values. I also provide an overview of my intervention, as well as outlining the potential contribution of the study.

Chapter two reviews the literature of education, in addition to the area of handwriting. In this chapter, I also study approaches to teaching handwriting.

The methodology is outlined in chapter three. This chapter outlines the action research paradigm. I discuss my research design and the methods I used to collect the data. How I analysed the data is also explored, highlighting ethics and validity around data.

In chapter four I analyse and discuss the findings from the data collected throughout the study. I identify the issues that arose from the analysis and I discuss the findings, relating to the theory.

In chapter five I discuss and reflect on my learning from participating in an action research study. Additionally, I address implications for future research and identify limitations of the study.

2   Chapter Two

Review of the Literature

2.1   Introduction

This chapter discusses the review of the literature. It is divided into two sections. Section one deals with education in the broader context, while section two examines the area of handwriting.

I examined these areas in order to identify an appropriate approach for answering my research question.

2.2   Section One: Education

2.2.1   The Purpose of Education

The Irish primary curriculum defines the purpose of school to 'promote the highest quality of teaching and learning for its children' (NCCA, 1999: 18). It states that education contributes towards the everyday development of the child (NCCA, 1999). Pring (2012) outlines four main purposes for education. He defines the first purpose of education as providing opportunity for people to think and make sense of the world in which they find themselves. The second purpose of education is to be practically engaged with the world in addition to developing the ability to think. The third purpose of education is outlined as developing the ability to make moral choices. Education also provides the ability to create a sense of community.

 Conway and Murphy (2013) argue that Irish educators currently face a culture of accountability. Educators must consistently abide by regulations and face pressure due to the attainment of results (Conway and Murphy, 2013).

2.2.2   Education and Change

'It is teachers who in the end will change the world of the school by understanding it' (Stenhouse, 1981: 104). Teachers have the power to ignite change in schools and develop a culture of learning. Stoll and Kools (2016) state that in order for this to be established, time must be provided for pedagogical dialogue and the exchange of ideas. Such collaboration among staff can result in greater interdependence and enhance learning. However, in order for change and innovation to occur, educators must take greater charge of their own learning. According to Brown (cited in Stoll and Kools, 2016), many schools find this difficult due to a lack of motivation among staff. This is because the idea of change to existing traditions and practices, in addition to the mindset of educators, can be a complex process. Teachers must be willing to examine their own practice and be open to change.

2.2.3   Standardised Testing

The pressure of standardised testing means that the 'banking' form of education is still current practice in many schools. The implementation of the Programme for International Student Assessment (PISA) has had a significant influence on education. Sjoberg (2019) argues that PISA defeats the purpose of education, as schools are measured with a common, standardised test and does not take into consideration a school's history, culture and values (Sjoberg, 2019). In 2009, PISA results for Ireland highlighted a reduction in literacy levels. Subsequently, the *Literacy and Numeracy for Learning and Life* (NCCA, 2011) strategy was introduced to schools which according to Conway and Murphy (2013) introduced results-driven accountability for Irish schools for literacy and numeracy. Results from the *Growing up in Ireland* study (McCoy et al., 2012) indicated that the allocation of additional time to literacy and numeracy was likely to impact time provided to other subject areas. Therefore, McCoy et al. (2012) argue that it is important for educators to deliver a broad a broad and balanced curriculum.

2.2.4   Initial Teacher Education

Lortie (1975) refers to the concept of the apprenticeship of observation where student teachers enter initial teacher training college and have spent many years in the education system observing and assessing teachers. However, these students did not look at these teachers from a pedagogical perspective and therefore only received a brief insight into a teacher's job (Lortie, 1975). During moments of uncertainty, student-teachers refer back to strategies learned during their education. Darling-Hammond (2006) refers to the problem of enactment, whereby student teachers struggle to implement theory into practice. This may partly explain why many didactic approaches are used in classrooms, as teachers are referring back to their own experiences of school.

2.2.5   Teaching approaches

Waks (2015) refers to didactic methods as those that involve a teacher-led approach and involve passive student listening. This approach results in both teachers and students experiencing boredom. McCoy et al. (2012) in the *Growing up in Ireland* publication, outlined that teachers with large classes are more inclined to use traditional teaching approaches. As mentioned previously, Freire (1970) refers to such didactic approaches as the 'banking method' of education .Dewey (cited in Waks, 2015) argues that these methods do not cater for learning and thinking and believes educators need to develop 'listening'. He uses this term to mean listening through the learning conversation. Waks (2015) believes that other methodologies encourage educators to be more active and engage in discussion with students. Such methodologies recommended in the Irish primary curriculum include guided discovery, the use of concrete materials, talk and discussion, using the environment and learning through play (NCCA, 1999). These alternative methodologies allow teachers to observe their students in order to develop future lessons (Waks, 2015).

2.2.6   Multiple Intelligence Theory

I have decided to look at the theory of Multiple Intelligence as I personally believe that each individual possesses different strengths and there are many types of intelligence found in the classroom context.   Gardiner (cited in Armstrong, 2009) defined the multiple intelligences as follows: linguistic intelligence, logical/mathematical intelligence, visual/spatial intelligence, bodily kinaesthetic intelligence, interpersonal intelligence, intrapersonal intelligence, naturalistic intelligence and existential intelligence. As children have different types of intelligence, teachers should try to use a broad range of strategies to support these (Stanford, 2003). According to Stanford (2003), multiple intelligence theory invites teachers to use a variety of teaching strategies which can be easily introduced to the classroom. Armstrong (2009) advises providing a variety of activities in the classroom to do this.

One of the benefits of multiple intelligence theory is that it can be applied across different subject areas (Suprapto et al., 2017). This would mean that for this research study, multiple intelligence theory could be used to support the teaching of handwriting. Gardiner's theory of MI has not escaped criticism. Sterberg (ctied in Suprapto et al., 2017) argues that there is little empirical evidence to support multiple intelligence theory and that it is often confused with learning styles. However, Chen (cited in Suprapto et al., 2017) argues that intelligence is not concrete and that multiple intelligence theory has been validated in classroom practice.

2.2.7   Gradual Release of Responsibility Model

The Gradual Release of Responsibility Model was first designed by Pearson and Gallagher (1983). It was designed as a model of instruction. The stages involved teacher modelling, followed by guided practice, eventually leading to independent application. This model involves progressing from the teacher taking all responsibility to a point where students

become independent learners (Fisher and Frey, 2013). In Pearson and Gallagher's 1983 model, there was no step for peer interactions. The revised model from Fisher and Frey includes this: focused Instruction, guided instruction, collaborative learning and independent learning. It is important to note that this model does not have to be delivered in this sequence.

2.3 Section Two: Handwriting

2.4 Definition of handwriting

The term handwriting is generally understood to mean a person's style of writing carried out with a written instrument. Griffiths (2015) describes the term handwriting as a complex perceptual motor skill that children are supposed to develop by the age of 8. It is an intricate process that develops over time as the internal mind interacts with the environment (Berninger et al., 2006). Until handwriting becomes automatic, it can cause difficulty for children in their performance of it (Limpo, 2018). Such difficulties will be discussed in section 2.8.1.

2.5 Rationale for Development of Handwriting Skills

2.5.1 Why Handwriting is an Important Skill to Develop

According to the DES (2011), if children do not receive the skills of literacy and numeracy, they will find many aspects of life challenging. Goves (2006), states that writing facilitates communication through the recording of messages. Graham et al. (2018) argue that it is important for children to become fluent in handwriting in order to minimise the impact of putting their thoughts and ideas on paper. Handwriting is a complex process that involves a variety of multi sensory systems, motor systems and muscle systems (Alston et al. cited in Berninger et al., 2006). If handwriting speed is not as quick as thought production, ideas are lost. This is because time is spent focusing on letter production when

writing. Therefore, children need to develop the ability to write legibly with speed (Graham et al., 2018).

Griffiths (2015) suggests that children need to develop pre-writing skills prior to learning to write formally. These skills can be developed from the age of one and include scribbling, imitating circles and lines. Formal writing usually occurs once a child starts primary school around the age of 5.

2.6   Handwriting in the Irish Context

2.6.1   1999 English Curriculum and 2015 Primary Language Curriculum

A primary language curriculum was introduced to Ireland in 2015. This curriculum involves both the Irish and English language. In the 2016/2017 academic year, the oral language strand was the primary focus from Junior Infants to Second Class. Subsequently, the reading and writing strands were concentrated on for the 2017/2018 school year. From September 2018, all strands were implemented. This is significant because while the junior classes of schools were focused on strands in the new primary curriculum, the rest of the classes were still using the 1999 English Curriculum. From September 2019, the same process will follow from Third Class to Sixth Class.

In the Teacher Guidelines for the 1999 English Curriculum, there is very little guidance for teachers as to how to approach the teaching of handwriting in the classroom. The teacher guidelines state what way children should write but does not provide teachers with examples or approaches to doing so. Culligan (2009) also shares this viewpoint, stating that what is presented in these guidelines is difficult for teachers to understand and lacks substance.

However, the primary language curriculum (2015) provides more guidance for teachers, by providing support material with recommendations for implementing handwriting in the

classroom. This new curriculum recommends that schools introduce cursive handwriting from an early age. This will be explored further in this chapter.

2.6.2   Handwriting Policy

As children progress through school life, there is a greater demand to write fluently, legibly and quickly (Culligan, 2009). According to the Department of Education and Early Childhood Development in Canada (2012), handwriting is a functional tool that assists children with communicating. Therefore, it is important that handwriting is considered an important component of teaching. It is for this reason that a policy should be created for handwriting so that consistency is achieved throughout the school (Warwick, 2017). In order for schools to do this, they would need to view current practice and agree on a set of outcomes to be achieved.

In 2011, the Department of Education and Skills in Ireland allocated additional time in the curriculum for literacy and numeracy. As a result of this, educators had to revise the learning outcomes for subject areas to allow for additional time to be spent on Irish, English and Mathematics. In terms of handwriting, this would mean that teachers would have additional time to teach handwriting as well as other areas of the English curriculum. However, it has been my experience in schools that as handwriting is not an area included on standardised tests, teachers often spend more time teaching content areas that appear on the test, such as reading and spelling.

2.6.3   A Multi-Sensory Approach to Teaching Handwriting

In 1943, Grace Fernald established a multi-sensory approach for teaching both spelling and handwriting (NCCA, 2007). A multi-sensory approach to teaching involves learning through more than one sense. This involves learning through visual, tactile, kinaesthetic and auditory outlets. Visual involves learning through the eyes, kinaesthetic involves learning through movement, tactile involves learning through touch and auditory learning

through sound. Many students experience teaching through visual and auditory forms of learning. However, Leeming (2015) draws our attention to students that may have difficulties in these areas, and therefore advocates the use of tactile and kinetic channels in addition to visual and auditory forms. This is to ensure that children develop tactile and kinetic memories, in addition to the visual and auditory when learning.

Further aspects of multi-sensory approaches to handwriting will be mentioned throughout this chapter.

2.7   Information Communication Technology (ICT) and Handwriting

Cutler and Graham (2017) believe that technology is a fundamental part of teaching handwriting. However, technology is not always available in schools (DEECD, 2012). Pencil and paper are the most commonly used writing tools used across the world and are readily available and affordable (Graham et al., 2018). Culligan (2009) states that there will always be a need for educators to teach children to write legibly, in order to focus on the organisation of ideas. Trilling and Fadel (cited in DEECD, 2012) state that communication and collaboration are important critical learning skills to be developed and that students must develop these skills in a variety of forms. Therefore children should learn and develop both typing and handwriting skills. Children are able to focus on higher level thinking when they have grasped their handwriting skills (DEECD, 2012).

2.8   Children's Experience with Handwriting

2.8.1   Struggling Writers

Although Goves (2006) recommends that children should be given lots of opportunities throughout the day to learn and practise letter formation, Graham (2018) argues that children who are experiencing difficulty with handwriting should receive additional instruction. This additional instruction should be explicitly targeted towards handwriting skills (NCCA, 2012). As part of this instruction, it is important that there are repeated

demonstrations from the teacher (Goves, 2006). Goves advises that children have the best chance to observe teachers holding a pencil and forming letters when they are in a small group. Furthermore, the DEECD (2012) recommends that there may be need for additional supports such as pencil grips, specially lined paper and, in some cases, one to one instruction. This additional support with handwriting is necessary, not only to develop skills, but also to develop a positive attitude towards handwriting ability and motivation to accept responsibility for work (Goves, 2006).

2.8.2   Letter Reversals

If children are forming letters incorrectly, this is difficult to reverse. Lloyd (1998) also shares this view, stating that it is important for children to have correct letter formation from the start. Liberman et al. (cited in Brooks et al., 2011) argue that children often confuse letters such as 'b' and 'd' due to phonemic confusion rather than letter processing difficulties. These letters are both formed along the vertical axis in addition to sounding similar. Teachers can adopt a variety of strategies to assist students with letter reversals. Brooks et al. (2011) suggested that in addition to visualising letters for long durations, numbered arrow cues assisted in reducing letter reversals. According to a study carried out by Brook (Berninger et al., 2006) a combination of arrow cues and writing letters from memory significantly reduced letter reversals. Therefore it can be said that handwriting instruction should include strategies to promote automatic letter production and retrieval of letter forms from memory, as it assists with automaticity and reversals (Berninger et al., 2006).

2.8.3   Children with Special Educational Needs

NCCA (2012) state that many children, especially those with special educational needs, experience difficulty with handwriting. Children that have special educational needs

dedicate a lot of attention and working memory during writing, as they are focused on the mechanics of handwriting (NCCA, 2012). This does not offer much time to develop ideas. Therefore, teachers should try to make the process of handwriting automatic, or if a child is really struggling to use technology (NCCA, 2012). The use of a multi-sensory approach, as discussed in section 2.7.1, is recommended to assist children with SEN.

2.8.4 Self-Confidence and Motivation

Warwick (2017) believes that when children produce work that is well presented, it helps to boost self-esteem and to develop self-confidence. Graham (2018) believes that if children find it challenging to form letters neatly and fluently, this can result in a negative attitude towards writing. Children then can adopt a mindset that they are unable to write (Berninger, Mizokawa and Bragg cited in Graham, 2018). The NCCA (2012) believe that left handed writers may struggle with motivation with handwriting, as they may experience problems with legibility. It is therefore important for educators to consider teaching approaches when teaching left-handed children as mentioned in section 2.11.3.

2.8.5 Cursive Handwriting

In recent years there has been considerable interest in the use of cursive handwriting in classrooms. Cursive handwriting is when letters are joined together. According to the NCCA (2012) cursive handwriting can minimise letter reversal, as children do not have to make as much spatial judgement. However, many schools in Ireland currently do not introduce cursive writing until children are in the middle classes. The new primary language curriculum advises the use of cursive handwriting from stage 2 of the curriculum, which is first and second class, depending on the developmental progression of the child. Culligan (2009) challenges this idea. He believes that cursive handwriting should be introduced at an early stage of school. Many schools in Ireland are now adopting this approach, introducing cursive writing from Junior Infants.

2.9   Important Features to Consider when Teaching Handwriting

2.9.1   Letter Formation

The consideration of correct letter formation instruction is important, as this allows children to develop the correct movement for each letter which enables fluent handwriting (NCCA, 2015). When writing, children should have consistent slope, size and shape (Goves, 2006). Children develop a visual motor memory of the important features of a letter when they are learning to write. This applies to numeral formation also. If children can form numerals efficiently, they will be able to record numbers automatically (Goves, 2006).

2.9.2   Letter Groups

Culligan (2009) argues that letters for handwriting should be introduced by their frequency of use in writing. In contrast to this, the DEECD (2012) recommends that children should be introduced to letter groups with similar features, as when the children learn to form one letter correctly, similar shaped letters will be easier to form. These can also be referred to as 'shape families' (DEE, 2001). One key letter is chosen to represent each letter group and this is a useful way for children to remember the starting point and movement when forming letters. The NCCA recommends that if letters are introduced according to their shape, this will reduce the amount the children will have to learn (NCCA, 2015).

According to the NCCA (2015) children perform three main tasks when handwriting: recalling the letter form, planning the sequence of strokes to make the letter and writing the letter so the action becomes automatic. This can also be transferred to include numbers in addition to letters. It is interesting to note that introducing letters in this way can also help children to distinguish between letters that are regularly confused (DEE, 2001).

2.9.3   Motor Skills

In order for children to become fluent and legible with their handwriting, they must develop fine and gross motor skills in addition to using language to talk about letters and recognising patterns (DEE, 2001). Children need to recall letter forms in addition to using motor skills when handwriting (NCCA, 2015).   Children develop the majority of the following skills through play and must be developed before writing with a pencil: fine motor strength, thumb opposition, crossing the midline, pincer grasp, finger isolation, eye-hand coordination, bilateral coordination, upper body strength and in-hand manipulation (Griffiths, 2015).

2.9.3.1   Fine Motor Skills

Fine motor skills are used by the hands and fingers to make small, controlled movements (DEE, 2001). Culligan (2009) argues that fine motor skills are a prerequisite for writing, as children's ability to form letters quickly and legibly may be impacted if they are not given opportunities to develop these skills. However, it is mainly infant classes that primarily focus on developing fine motor skills. Given that children across all classes in primary school have to write regularly throughout the school day, it is important that fine motor skills are well developed.

2.9.3.2   Gross Motor Skills

According to McMurray et al. (2009) activities such as writing require movements that are repeated continuously to reproduce the same result. In terms of writing, this would mean that when children are forming letters, this is dependent on a correctly learned motor plan sequence (McMurray et al..2009). The development of gross motor skills is a way to assist with this and should be used to develop handwriting (DEE, 2001). Gross motor skills are controlled movements of the limbs and body which are important for handwriting, as good balance and posture is required (DEE, 2001). The vocabulary of movement can be used

with children to do this, showing children how to make large movements with the body (DEE, 2001).

2.9.4 Pencil Grip

Pencil grip has been identified as an important factor in helping children to write. An efficient pencil grip needs to be developed to assist with control, flow and speed of writing. The tripod grasp is recommended for writing, as it helps with letter formation and encouraging fluency (Griffiths, 2015). The DEE (2001) also recommend this, stating that the pencil should be held between the thumb and forefinger with the pencil resting on the third finger. According to the National Health Service (NHS), a child must have sufficient muscle strength in their hand to have the ability to hold and use a writing instrument. The NHS recommends activities such as bead threading, using clothes pegs, picking up cotton balls with tongs and bubble wrap to develop this area.

Some children have difficulty because of applying too much pressure when using a pencil. The DEE (2001) states that if a writing instrument is gripped too tightly, it will stop free flowing movement and the child will tire easily. In addition, a tight pencil grip will also cause the arm to tense and therefore increase pressure on paper. Reasons for children applying too much pressure might include their position at the table, posture and arm and shoulder stability (Griffiths, 2015). Therefore, it can be said that children should have the opportunity to engage with gross motor skills in order to combat this.

2.9.5 Verbal Pathways

Auditory attention and memory is important for children to become aware of the importance of communication through writing (Griffiths, 2015). In order for these areas to be developed in the classroom, the NCCA (2015) recommends the use of 'verbal pathways' when teaching handwriting, as it helps to support automaticity. There are defined as verbal directions to assist with the sequence of movements when learning to

form a letter (NCCA, 2015). Clay (cited in DEECD, 2012) makes reference to an experiment where students were encouraged to sound out and describe the features that formed the letter; only four repetitions of the letter were needed to gain success in comparison to 50 repetitions when only asked to copy the model of the letter. For example, if teachers were to introduce letter formations using verbal pathways, less time would be required teaching this in contrast to copying letters from the board. This highlights the importance of including verbal pathways when teaching handwriting to students.

Verbal pathways appeal to auditory learners and therefore contribute towards a multi-sensory approach to teaching. Warwick (2017) advocates the need for this, stating that teachers should talk through formation when modelling letters for the children. Griffiths (2015) further highlights the need for children to develop handwriting through auditory skills. It is suggested that children should repeat instructions back to the teacher when learning letter formation.

As mentioned earlier in this chapter, schools should adopt a handwriting policy. The NCCA (2015) believes that teachers should agree on specific words to be used when discussing handwriting with the children. Examples of this include the terms 'letter bodies' for the rounded parts of the letters and 'base line' for where the letter bodies sit. Warwick (2017) also agrees that it is important for language to remain consistent throughout a school.

2.9.6 Patterns

Patterns are identified as a useful way to enhance handwriting. Examples of patterns include zig-zags, spirals and loops. Warwick (2017) suggests that teachers should establish a connection between writing and patterns. This is because patterns can be a useful way to encourage rhythmic movement and fluency in handwriting. As a child makes a pattern, he or she has to continuously repeat the pattern which mimics the movement for forming

letters (NCCA, 2015). Fine motor control, hand-eye coordination and correct letter shapes will be developed by creating patterns (Goves, 2006). Additionally, patterns can help to foster enjoyment when writing among children (NCCA, 2015). Therefore, the children can create the letters in a relaxed manner.

The DEE (2001) state that patterns should be used to encourage the left to right orientation of writing. Patterns that are connected to letter formation include arches, loops, garlands and circles made in anti-clockwise directions (NCCA, 2015).

The NCCA recommends the use of blank paper when creating patterns and they can be useful for developing the skills of children in older classes as well as those in younger classes (NCCA, 2015). This also integrates well with the Visual Arts curriculum, as one of the skills children must develop is an awareness of pattern and rhythm.

As mentioned previously in this chapter, a multi-sensory approach to teaching is useful for appealing to different learners in the classroom. Griffiths believes children should be encouraged to draw shapes rhythmically accompanied by music (Griffiths, 2015). The DEE (2001) also encourages music when creating patterns and believes that it is important for children to discuss movements being made when using patterns. It can be useful for children to create patterns as a warm up in order to enhance fine motor and perceptual skills (NCCA, 2015).

2.10 Handwriting Lessons

2.10.1 The argument for explicit handwriting instruction

Educators need to explicitly teach and have a systematic approach to teach handwriting (Culligan, 2009). This is because handwriting needs close monitoring. (DEECD, 2012). Explicit handwriting instruction assists handwriting, as well as helping with the organisation of writing (NCCA, 2012). A study carried out by Berninger et al. (2006)

demonstrated that handwriting instruction was effective in the increase of speed and automaticity.

Teachers often experience repeated mistakes in children's written work. Small letters can make it hard for teachers to identify correct letter formation. In order to overcome this, the spacing used between letters, between words and lines should be emphasised to children during writing lessons (Goves, 2006). The Department of Education and Children's Services in South Australia also recommend that children should be given explicit handwriting lessons in order to prevent poor handwriting skills (Goves, 2006).

Teachers should consider the physical conditions when children write, such as posture, paper position and pencil grip (NCCA, 2012). The DEE (2001) believe that good posture is crucial when children are handwriting, as if children do not find themselves in a good seating position, they will experience fatigue, headaches and pains in their shoulder and arms. Additionally, teachers should ensure there is good lighting in the classroom and table heights are at an appropriate level prior to starting writing activities (DEE, 2001).

2.10.2 Organisation of Lessons

Graham (2018) believes that children should receive 75-100 minutes of handwriting instruction per week. However, given that teachers have to teach a broad literacy curriculum, this may be difficult. Although a time allocation is provided in the primary school curriculum for English, there is no specified time for handwriting instruction.

According to the DEECD (2012), handwriting should be taught whole group, then small group, followed by independent instruction. A research based model that is used effectively in literacy practices is the gradual release of responsibility model, as mentioned earlier in this chapter (DEECD, 2012). Additionally, regular revision lessons are important (Warwick, 2017).

2.10.2.1 Integration

Goves (2006) recommends that an integrated or thematic approach should be used for handwriting in order to provide a good learning experience for the children. This would assist in adequately managing time among other subjects.

2.10.3 Structure of Lessons

Short handwriting sessions should be timetabled daily in all classes (Culligan, 2009). Students gain maximum benefit from short, focused sessions of handwriting (Goves, 2006). If children receive instruction and opportunities to practise their handwriting in meaningful contexts, writing movements are reinforced and become an automatic process (Goves, 2006).

Children should learn to recall letters from memory (NCCA, 2015). Strategies to do this include asking the children to close their eyes and visualise the letter and writing letters through dictation. In addition to this, Graham also recommends that children should practise tracing and copying in order to write letters from memory.

Warwick (2017) states that children enjoy the quiet element of handwriting lessons, as it allows them to concentrate**.** When delivering a handwriting lesson, teachers should provide a combination of whole class writing time, small group writing time and independent writing time (Goves, 2006). A handwriting lesson should have a specific focus such as revision or the correct formation of a single letter. It is important for teachers to highlight the difference between writing on flat and vertical surfaces in the classroom and to model how to sit at a table and write (Goves, 2006)**.** Teachers should remind children of good writing habits, which include keeping feet on the floor, using the non dominant hand to hold the page and slightly tilting the paper (DEE, 2001). Graham et al. (cited in Graham 2018) recommend that teachers should provide children with numbered arrow cues to

guide letter formation. Goves (2006) recommends that at the end of a writing activity, children should come together to share their experiences.

2.11 Classroom Environment

2.11.1 Physical Environment

The classroom environment can assist children's ability to self-initiate writing. This can be encouraged by including environmental prints and making writing materials readily available to the children (Zhang, 2015). The classroom environment reflects how teachers support children's writing through the use of display (Zhang, 2015). A study carried out in preschool classrooms across the USA, demonstrated that classrooms that contained supports to aid a good writing environment assisted children with name-writing performance (Zhang, 2015). The DEECD (2012) recommends that it is useful for children to have alphabet strips on their desks to assist with writing. Learners should be allowed to discuss the names and features of letters as this promotes letter recognition in texts, on computer keyboards and in the environment (Goves, 2006). Educators should consistently refer to displays of handwriting in the classroom and use opportunities throughout the teaching day to highlight and reinforce handwriting skills (Goves, 2006). Writing skills can be developed when children are surrounded by print rich literacy environments (Graham cited in Dinehart, 2014).

2.11.2 Left-hand Writers

It is important for left-handed writers to sit on the left of right-handed children (DEE, 2001). According to the DEE (2001) 10% of the population write with their left hand. Often more than 10% of children in a class are left-handed (Howard, 2019). Some children that write with their left hand have a natural tendency to write using a right to left orientation (NCCA, 2012). As a result of this, teachers need to check that left-handed writers do not develop poor pencil grip or posture (Culligan, 2009). In order to assist

children who write with their left hand, it is important for teachers to ensure children can see the letter they are writing (NCCA, 2015). The DEE (2001) states that teachers should check children have a good pencil grasp and are seated correctly. In order for a child to be seated correctly, the height of a seat may need to be adjusted for left-handed writers. When holding a pencil, children who write with their left hand should hold it slightly further away from the tip so they can see what is being written on the page (Goves, 2006). The DEE (2001) recommends that when teaching left-handed children, teachers should model the formation with their left hand. In addition to this, it is also recommended that teachers put a mark on the left side of the page to remind children of the left to right directionality of writing. Teachers should ensure they monitor the writing of left handed children closely, as writing left to write is more challenging for these children (DEE, 2001).

2.12 Assessment of Handwriting

Goves (2006) believes that teachers should focus on fluency, speed and legibility to assess handwriting in order to inform future planning and observe progress. Warwick (2017) suggests conferencing for the assessment of handwriting. The NCCA (2007) defines conferencing as a meeting between the child and teacher to understand and discuss the child's work. This involves the children verbalising the process while they are writing so teachers can identify problems and see the children's thought process. Goves (2006) similarly advises the use of conferences during handwriting lessons to monitor progress and give constructive feedback as the children are working.

2.12.1 Self –Assessment

Graham (2018) asserts that in addition to teachers providing feedback, students should also evaluate and correct their handwriting. Students should be given the opportunity to self assess their work. According to the DEECD (2012), self- assessment of handwriting skills gives children ownership of their learning, in addition to developing meta-cognitive skills.

This involves children reflecting and becoming involved in their learning. In order for children to develop such skills, teachers must model thinking out loud and guide children through a developmentally appropriate self-assessment process (DEECD, 2012). A child is more likely to experience success when a goal or target is identified (Fisher and Frey, 2013).

The NCCA (2015) recommends that children self-monitor their work. This could be implemented by using success criteria. Success criteria are features that a teacher wants the children to include in their work. These can be co-created between the students and teacher. Children can compare their work to the success criteria in order to self-monitor their work.

2.13 Conclusion

To conclude, it is evident that handwriting is an important skill for children to develop. I have highlighted handwriting in the context of the Irish education system, in addition to outlining possible approaches to its implementation in the classroom. The next section discusses the methodology of the study.

3   Chapter Three

Methodology

3.1   Introduction

This chapter discusses the methodology of the research project. I have identified my concern in the classroom of using a didactic style to teach handwriting. I therefore wish to explore how I can adapt my teaching to a more child-centred approach. My current research question is 'How can I create a more enriching experience for students when I am teaching handwriting?' I explain my reason for selecting self-study action research. I outline my research design. I discuss the research instruments and my rationale for choosing these. I end this chapter by discussing the way that I analysed the data that I collected throughout the project, taking into account ethical considerations.

3.2   Research Paradigms

As part of the research process I was required to think deeply about and reflect on the nature of knowledge. This was necessary because a researcher's view on knowledge can have an influence on the research paradigm that is chosen. Depending on the values that we hold regarding teaching, learning and knowledge, we select a research paradigm that lives in line with these values (Sullivan et al., 2016).

3.2.1   Action Research Paradigm

Kurt Lewin developed action research as a theory and approach to research in the 1940's (Merriam and Tisdell, 2016). It is a type of practitioner research that explores how practitioners make sense of problems or issues in the workplace (Sullivan et al., 2016). In essence, action research is the development of an area of practice in addition to becoming a reflective practitioner and creating new knowledge (Merriam and Tisdell, 2016).

The action research process is developmental and is viewed as a form of self-evaluation (Mc Niff, 2002). Action research can change people's thinking and actions in order to develop future practice (Kemmis, 2009). Research is carried out with participants as opposed to on participants and therefore include the participants as part of the study as co-investigators (Merriam and Tisdell, 2016). Teacher researchers generally carry out research with their students in their own classes to enhance an aspect of their practice (Merriam and Tisdell, 2016).

Action research can result from a concern a teacher might have about their practice. Generated from these concerns, a new strategy may be implemented using the 'plan, act, analyse and reflect' cycle (Merriam and Tisdell, 2016). As action research involves reflecting on the work carried out, it can be referred to as a form of self-reflective practice (Mc Niff, 2002). Dewey (1933) advocated the use of reflection, believing it was an important aspect of developing practice.

I chose an action research paradigm, as it was the closest to the values I held. I wished to enhance my practice and to develop new knowledge about myself as a teacher in addition to learning more about the children I teach. I wanted to understand why I teach the way I do. Mc Niff (2002) considers action research as a practical means of examining one's work to check that one is living to personal values. Through reflection, I realised that I value fairness. I value child-centred methodologies. However, there were some areas of my practice where I was not being fair. This is why I chose to carry out action research, as I identified an area of practice that I want to improve and to develop my own learning.

Qualitative and Quantitative Research

According to Cohen et al. (2007) the qualitative researcher tries to capture the lively nature of events and acquire what is happening in the participant's worlds. Although possible to include a quantitative component, most action research studies typically use only

qualitative data collection (Merriam and Tisdell, 2016). Given the age of the children and the difficulties they may have had articulating their ideas, I decided to take a pragmatic mixed-methods approach to data collection.

According to Sullivan et al. (2016) as teacher researchers, a large amount of both qualitative and quantitative data may be collected but we may find it difficult to identify which is important until it comes to the validation process.

3.3 Research Design

3.3.1 Research Site / Context

The participants for this research were chosen as they were the class I was given .The research took place in my classroom in a rural, co-educational school. Thirty-two first class children were invited to take part in this research. Thirty children returned consent/assent forms and data collection only started once permissions were in place. Those taking part in the research project were made aware that they had the right to withdraw at any stage. Children who did not return consent/assent forms were still free to take part in the activities that took place in the classroom during the study but data was not collected from these children.

3.3.2 Overall design

In order for me to make changes to my practice, I had to develop an action plan. I used the action plan as suggested by McNiff (2002) in order to try and answer my research question:

- I review my current practice
- I identify an aspect that I want to investigate
- I imagine a way forward
- I try it out
- I take stock of what happens

- I monitor outcomes of modification
- I review and evaluate the modified action,

I identified the concerns in my practice and what I wished to change. The next step in the action plan was to find a way of improving this situation in my practice. I describe how I made these modifications.

3.3.3   Action Research Cycle 1

The three areas that I felt could help improve my practice included the classroom environment, introduction of fine and gross motor skills and changes to my handwriting lessons. I explain my reasons for choosing these areas in the following paragraphs.

Coming back to my Froebelian values, I realise the importance of a good environment for children when teaching. I wanted to look at the environment that I was creating for children when I was teaching handwriting and how I could make changes to this. I decided that I would create a display board specifically for handwriting. I also made the decision to include alphabet strips as recommended by the DEECD (2012) on the children's tables so they had the letters in front of them.

When I was researching handwriting, I realised that fine and gross motor skills appeared to have a huge influence. As one of my aims with this research study was to improve my own knowledge in this area, I decided to introduce these skills into my classroom to see if this would contribute towards handwriting. I implemented fine motor skills in the form of rotating stations. Rotating stations worked in the following way. Each group received a different activity that rotated on a daily basis. I made the decision to have these fine motor skill stations in the morning when the children came into school, as each child was in the classroom during this time and I wanted to live my value of fairness. Activities that I introduced for these are included in the appendix b. Gross motor skills were carried out as

transitions throughout the school day. This meant that the children would perform gross motor skills for a short period between different subject areas.

I made the decision to teach a handwriting lesson every day after lunch, a time when every child in the class was present. This was different to my previous practice of only teaching one handwriting lesson a week. In order to be true to my value of fairness, I included a multi-sensory approach to my lessons so that all children had a chance to learn the formation of the letter. I used the Gradual Release of Responsibility Model (Fisher and Frey, 2013) to provide a structure to my lessons and to avoid me teaching in a didactic manner. This involved me modelling the letter for the children, the children and I forming the letters together using multi-sensory approaches. Following this, the children formed the letters independently. The multi-sensory approaches included the visual form of the letter, forming the letter in the air, repeating the verbal pathway and the children forming the letter on different textures such as tables, carpet and hands. I made the decision to introduce the letters in shape families as recommended by the DEE (2001).

I constantly 'reflected-in-action' and 'reflected-on-action' (Schön, 1983) throughout the research cycle and made small changes as I went along collecting data. 'Reflection-in-action' included changes I instantly made such as revising the words of a verbal pathway during a lesson if the children were not grasping it. 'Reflection-on-action' involved deeper reflection about the overall research process. At the end of research cycle one, through discussions with my critical fiends and analysing the data I collected, I made changes to modify my approach in order to make the experience more interesting for the children.

3.3.4   Action Research Cycle Two:

Children's work was added to the handwriting display for research cycle 2. This was regularly updated with different work. More reference was made to the handwriting display throughout the day.

The handwriting lessons continued every day. The format of the handwriting lesson remained the same as research cycle 1, with some adaptations. Self- assessment was added to handwriting lessons to encourage the children to take responsibility for their own learning. This was introduced in the form of success criteria. If the children were struggling with a particular aspect of handwriting such as writing on the line, this was added as part of the success criteria. The children then had to compare their work to this.

The use of pattern was also introduced to handwriting lessons as a warm up. I chose to introduce this as I was guided by the literature in this area. I also provided the children with pattern worksheets as an early finisher task.

The fine motor skill stations continued but were integrated with other subject areas. Sight words were integrated at the play dough station. Challenge cards were provided at the lego station. Pictures of buildings and landmarks were given to provide ideas for those using construction straws and threading boards. Cutting was introduced as a station, as it was observed many children were having difficulty with this.

3.4   Data Collection Instruments

I collected data in four ways: observational notes, my critical friends, my reflective journal and children's work samples. I justify my reasons for selecting these data collection instruments in the following paragraphs.

3.4.1   Observational Notes

I took the epistemological stance that children are valid contributors of knowledge. For this reason, I wished to include the voice of the child through observations and everyday conversations. This was in line with my ontological stance that everybody has the right to be listened to and contribute to a fair society. According to Merriam and Tisdell (2016) we observe in everyday life but most of this is part of our routine and is different to research observation. As a research tool, observation is methodical and can address a research

question (Merriam and Tisdell, 2016). One disadvantage of using this research instrument is that observations can be subjective. When recording observations, I ensured that I was honest and wrote factual accounts of what was happening. Bell and Waters believe that participant observation allows changes to be documented over time and therefore can generate important data (Bell and Waters, 2014). What a participant observer sees is authentic and can use his or her knowledge to decipher what is observed (Merriam and Tisdell, 2016).

I decided to use unstructured observations, as I felt it allowed me to record different things that I observed throughout the day and helped to establish areas I wished to explore further for cycle 2. According to Cohen et al. (2007) unstructured observations allow researchers to examine the observational data prior to determining an explanation for what is happening. Schensul and LeCompte (cited in Merriam and Tisdell, 2016) state that a researcher's interest will determine what is observed initially and eventually through continuous observation, questioning and patterns of behaviour, events will emerge. Cohen et al. (2007) argue that it can take a long time to catch the behaviour when using observations. As recommended by Merriam and Tisdell (2016) I used my research question as a starting point for my observations. My research question was 'How can I provide a more enriching experience for students when teaching handwriting?' Merriam and Tisdell (2016) state that the focus of observations must be allowed to materialise and adjusted over the course of study.

Initially, I recorded observations in a dedicated notebook. However, I quickly realised that taking the time during the classroom day to write into a specific notebook was difficult because of the time involved. I decided to write down observations on notes which I later placed in the notebook. I dedicated time to recording observations while the children were

participating in the activity centres and during handwriting lessons. Any behaviours or incidents that occurred throughout the day I recorded in the notebook.

3.4.2   Reflective Journal

I chose to use a reflective journal to document the thought process in my practice and to show changes I made throughout the study. I used the journal to reflect on issues or events that arose throughout the action research cycles. According to Holly (1989) journal writing can be a powerful means for educators to record classroom life and examine practice. Reflecting on issues that arose throughout the research project allowed me to document my professional learning in addition to exploring areas that came up throughout the project. According to Sullivan et al. (2016) a reflective journal allows educators to revisit daily situations in the classroom and to look with a new perspective.

The reflective journal also allowed me to further explore ideas that arose from the observations or conversations. I did what Schön (1983) refers to as 'reflecting-in-action' and 'reflection-on-action'. When an incident occurred throughout the school day that seemed significant when I was teaching, I recorded this on a note to document my idea. I then reflected on this idea at a later stage.

Brookfield (2017) suggests that the only way to acknowledge our assumptions is through different perspectives and proposes viewing practice through four different lenses: (1) our autobiographies as learners (2) student's eyes (3) colleague's experiences and (4) theoretical literature. In my reflective journal, I tried to examine my practice through the lenses recommended by Brookfield in order to view my practice from different viewpoints.
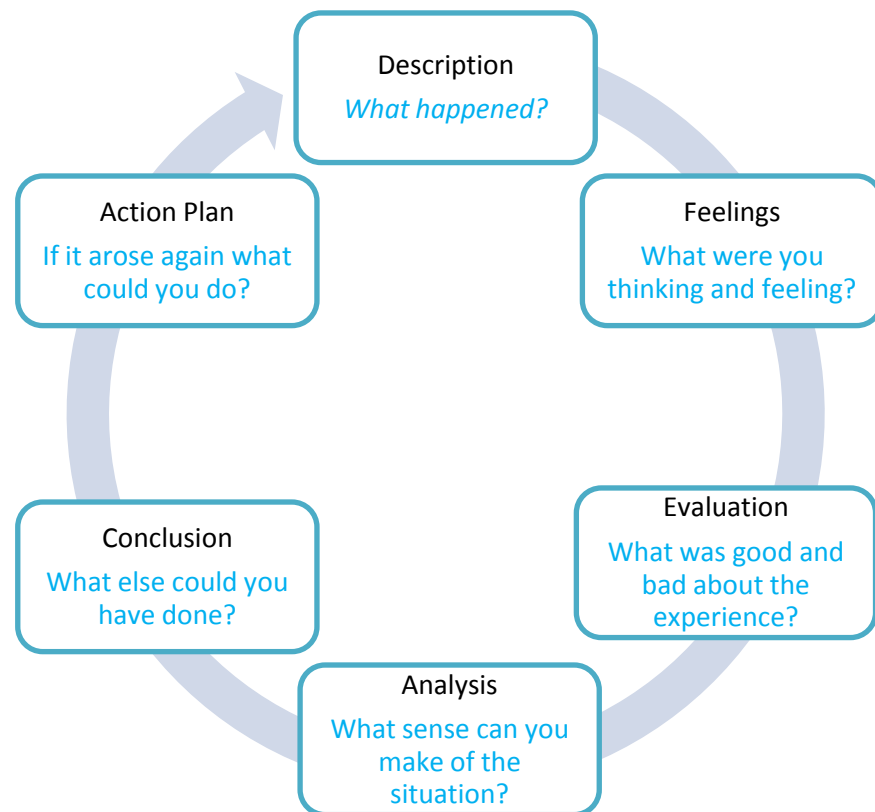
Figure 1: Gibbs' Reflective Cycle (1988)

I used Gibb's model of reflection as a guideline when I was writing my reflections (Gibbs, 1988). I chose this model as I felt that it helped me to reflect and think more systematically when I was writing and to gain more insights on my learning and thoughts throughout the study.

3.4.3 Critical Friend

Dialogue is considered an important factor in the action research process (Sullivan et al., 2016). Mc Niff (2002) encourages the use of a critical friend so that the judgement of work carried out is not solely based on one's own opinion. I asked a colleague at work and a friend that taught the same class level in a different school to be my critical friends throughout this research study. I felt it was important to have critical friends that taught in different contexts and believed it would help me gain new perspectives by doing this. I spoke regularly with my critical friends about different ideas that I had and to check that I was living in line with the values that I held. A critical friend helps examine work carried

out and to evaluate the quality of the research (Mc Niff, 2002). Critical friends challenged my thinking and provided me with different insights and opinions, in addition to providing support throughout the intervention.

3.4.4 Children's Work Samples

Children's work samples were selected for this study given the nature of the area I was researching. As I was researching the area of handwriting, I believed work samples to be a good way to see how the children progressed in this area. This data collection instrument was from the lens of the pupil. It helped me to check if my teaching style was helpful to the children. Free writing is a method of assessment that I used regularly in the classroom. This is where the children are given lined paper and are free to write about whatever topic they choose. During free writing, the children are aware that their work will not be corrected. I used free writing for the study as a starting point of their writing because it was something that the children were used to and to avoid them feeling under pressure. I used this method of assessment throughout the project as a way of documenting their progress.

Although the majority of my methods were qualitative, I felt that it was important to check if there was a difference in the children's handwriting ability throughout the process. Therefore, I needed to use a quantitative method to do this and why I chose to use children's work samples.

3.5 Data analysis

3.5.1 Thematic Analysis

I chose thematic analysis for analysing the qualitative data that I collected. According to Braun and Clarke (2013) thematic analysis is a commonly used analytic method for qualitative data. Thematic analysis identifies and analyses patterns (Braun and Clarke, 2013). According to Cohen et al. (2007) qualitative research can accumulate large amounts of data. I chose this method to analyse my data as I believed that it was the most practical

for the type of data I collected and given that I had a lot of data to analyse, it was a useful

way to go through a large volume of data.

Braun and Clarke (cited in Braun and Clarke, 2013) devised stages of thematic analysis to

help researchers analyse data. These are the following phases that are recommended:

1. Familiarisation of the data: reading and re-reading the data
2. Coding: generating labels for important features of the data
3. Searching for themes: Meaningful pattern in the data
4. Reviewing themes :If the themes tell a convincing story about the data
5. Defining and naming themes
6. Detailed analysis of this theme and how it fits in with overall story about the data
7. Writing-up: Combining the narrative and the data

This is the model that I used when I analysed the qualitative data. I assigned codes that I

felt were appropriate to what the data was saying. I then condensed the codes where

possible in order to find emerging themes.

3.5.2   Handwriting Checklist

An adaptation of Culligan's (2009) handwriting assessment was used to analyse the

progression of the children's handwriting. This checklist can be found in appendix e. I

chose to adapt this checklist because I was carrying out research in my own classroom and

therefore wanted to choose what I felt to be the most suitable to the children I was

teaching. My critical friend helped me with the adaptation of this checklist.

The following categories were examined for each pupil's writing:

Category	Description
Pencil Pressure	Pencil too light on page or too heavy
Letter Formation	Correct sequence of strokes to write letter
Correct Starting Point	The letter is started at the correct point to ensure correct

	letter formation
Letters Closed	Letter strokes closed off properly
Letters Properly Rounded	Each letter has adequate spaces between the letter strokes
Spacing of letters/words	Adequate spacing so words and letters are distinguished
Slant of Letters	All letters consistently slanted
Maintains uniform letter size	All letters maintain a consistent size
Ability to keep letters on line	All letter bodies touching base line
Left-Right Directionality	Writing with left to right orientation on the page
Mirror Writing	Writing words backwards such as 'tnew' for 'went'
Letter/Word Reversals	Letters that are formed in the opposite direction
Speed of Writing	How much writing is produced on the page in a given timeframe

Figure 2: Handwriting Checklist Table

Ordinal data signifies order (Cohen et al, 2007). Under each of the 15 categories, an evaluation of the student's handwriting was completed using an ordinal scoring system ranging from 1-4 depending on quality. The table below outlines the scoring criteria.

Ordinal Scoring – Handwriting Assessment	
1	Poor
2	Fair
3	Good
4	Excellent

Figure 3: Ordinal Scoring System

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3.5.2.1 *Sampling process*

Patton's (1990) recommendation of random purposeful sampling was implemented to select children's writing samples. This strategy is used in qualitative research to select 'information-rich' samples when working with limited resources (Patton, 1990:169). A sample size of 10 students was collected. This number of observations was agreed following a consultation with my critical friend – one third of the class was chosen on the basis the sample size was sufficient, yet small enough to allow a comprehensive assessment of each student's handwriting across the 15 categories. 5 girls and 5 boys were selected for the sampling process. I laid out the children's copies with pseudonyms on them. Girls' names were on one side, boys' names were on the other. 5 samples were chosen randomly from each set. A list of pseudonyms and correct pupil names were kept on en encrypted file on a password protected computer. A sample of writing was looked at before the intervention took place, at the end of cycle 1 and at the end of cycle 2. These samples were pieces of free writing that I collected at each stage. If a pupil was absent when this piece of free writing was collected, I looked at their most recent piece of writing in their literacy copy to analyse the writing.

3.6 Role of the Researcher

3.6.1 Validity

Habermas'(1976) criteria for social validity include the researcher speaking comprehensibly, truthfully, authentically and appropriately. By engaging in dialogue with critical friends and colleagues, social validity can be checked. I regularly spoke to my critical friends about decisions I was making during the research process.

Guba and Lincoln (cited in Bryman, 2016) recommend two criteria for the assessment of qualitative data; trustworthiness and authenticity. I did this by acknowledging both positive and negative aspects of the study. Sullivan et al. (2016) state that by recognising pitfalls

and setbacks as well as positive elements, a researcher's integrity and perceptiveness is emphasised.

According to Bryman (2016), triangulation involves using more than one method to collect data. I also used triangulation to ensure validity in my research.

3.6.2   Ethical Issues in Data Collection:

A significant aspect of carrying out action research is ensuring that I as a researcher adhered to ethical standards in my work. I provided my principal and board of management with a copy of my consent forms and information outlining the study. As a teacher-researcher, the children's best interests were central to my research. The children were informed of the research throughout the intervention. Informed consent was sought and received from the parents and assent was obtained from the children. Data was not collected until these were in place. The children were made aware that they were free to withdraw from the research at any time. In my observations and reflective journal, I initially wrote down the children as numbers according to the number they are assigned alphabetically on the school roll. However, I realised that this was not practical, as I had to keep referring back to the roll to check which child I was writing about. I decided instead to use pseudonyms when recording observations and writing in my reflective journal. This was to ensure anonymity in my reflections and observations. The children's work was kept in the classroom. Staff and children had access to this work.

Data was not collected until permissions were in place. When I interpreted the data, I remained honest. I did not collect data from the children who did not return consent forms.

My critical friends were also aware that they were free to withdraw from the research at any time.

3.7 Conclusion

In this chapter, I have outlined the action research paradigm and justified my reason for choosing an action research methodology. I have drawn attention to my research design and the instruments I used to collect data. In addition to this, I made reference to validity and ethics as part of the process of collecting data. In the next chapter, I will explore the analysis of the data and discuss the findings that emerged from the data.

4   Chapter Four

Data Analysis and Discussion

4.1   Introduction:

In chapter three, I explained how I analysed the data collected throughout the intervention. I present the qualitative data I collected under the emergent themes that arose from thematic analysis. The quantitative data is presented after this, using a graph to demonstrate the findings. I discuss my learning throughout the research process, including parts of the intervention that did not go to plan.

4.2   First Finding: A supportive classroom environment contributes towards the development of handwriting skills

The children made regular use of the visual aids that were placed around the room to assist with handwriting.

> Observation 26/2/19: *Lily* was writing story and asked for help. When she was writing a sentence, she was writing the word 'girl'. When she was about to write the letter 'g' she looked at the alphabet strip on the table to check which way it should go.*

Some children also used environmental print displayed around the room as a source of inspiration for the activities they used during fine motor stations:

> Reflective journal entry 13/2/19: *Today Oisín* at the lego station made a cottage. He said "I made a cottage like the one on the wall".* (He was referring to artwork that was on the wall based on the topic of houses) *This again has highlighted to me how the items that are placed around the classroom can be a source of inspiration and learning for the children. This is definitely making me more aware of the*

impact I am making when I am putting something on the walls in the classroom. Although I have always valued a good, stimulating environment, I have never realised the significance of the items that are placed on the wall.

This was an insightful moment for me. It encouraged me to think about the decisions that are made by teachers regarding the immediate surroundings of the classroom. This was once again highlighted to me when a child used content in the classroom environment to inspire an idea at his fine motor skill station:

Reflective Journal Entry: 13/3/19: *......Oliver* brought me over to what looked like a house made out of straws and connectors. He said, "Teacher that's leitís (lettuce) growing in the teach gloine (glass house)". I was amazed by his use of Irish in his creation. This was part of the vocabulary we had been learning for our Irish lessons. I asked him where he got his idea and he said he looked at the Gaeilge board and saw the pictures and decided to make them. I now realise I have an important role in deciding what goes on the walls of the classroom.*

In the future, I will ensure that I carefully consider the items that I place on the wall in the classroom. I had never before considered how items on the wall of the classroom could inspire children's work.

The children started to become more aware of letter formation and environmental print in the classroom.

Observation 12/2/19: *When I was writing the word 'sunny' on the board, Lily * said 'Look teacher, there's two one armed robot letters!'*

The children used the handwriting display board to practise handwriting in their early finisher copies. These were copies the children were free to write in, based on a topic of their choice, when they finished classroom work.

> Journal Entry 7/2/19: *Today I walked around the classroom helping some children with their work. Some were finished and working in their early finisher copies. I noticed some were practising the one-armed robot letters in their copies. I was surprised to see this because I had not given them this idea. I realise it was because the children have an interest in developing their handwriting. It was gratifying to see the children were using the supporting material I provided on the wall, and used their own initiative. I am supporting children in the classroom with the materials I provide in the environment.*

In addition to this, I observed the children using the display board as part of a game they created. 'Golden Time' is a reward system I implemented in the classroom on a Friday afternoon for good behaviour. I provided materials and games and the children were free to choose whichever game they wanted to play with. I wrote this journal entry following an observation made during this time.

> Reflective Journal Entry 8/2/19: *Today, 4 girls brought chairs over to the handwriting display board. One child pretended to be a teacher, pointing to the letters and saying the verbal pathway while the other children repeated. This amazed me, as what I was doing in class translated across into the children's socio-dramatic play. I also think this is because I am enthusiastic about teaching handwriting and the children can sense this. It has made me more aware of how I come across in other subjects that I teach.*

I was reminded of my Froebelian values when I saw the children playing this game. Learning through play is important for children and it is something that I have been

neglecting in my practice. I am now going to make a conscious effort to try and include more play-based learning in my teaching.

Reflective Journal Entry 14/2/19: *Today I asked the children's opinions about useful supports I could introduce in the classroom to assist with handwriting. One child suggested including some of their work on the handwriting display.*
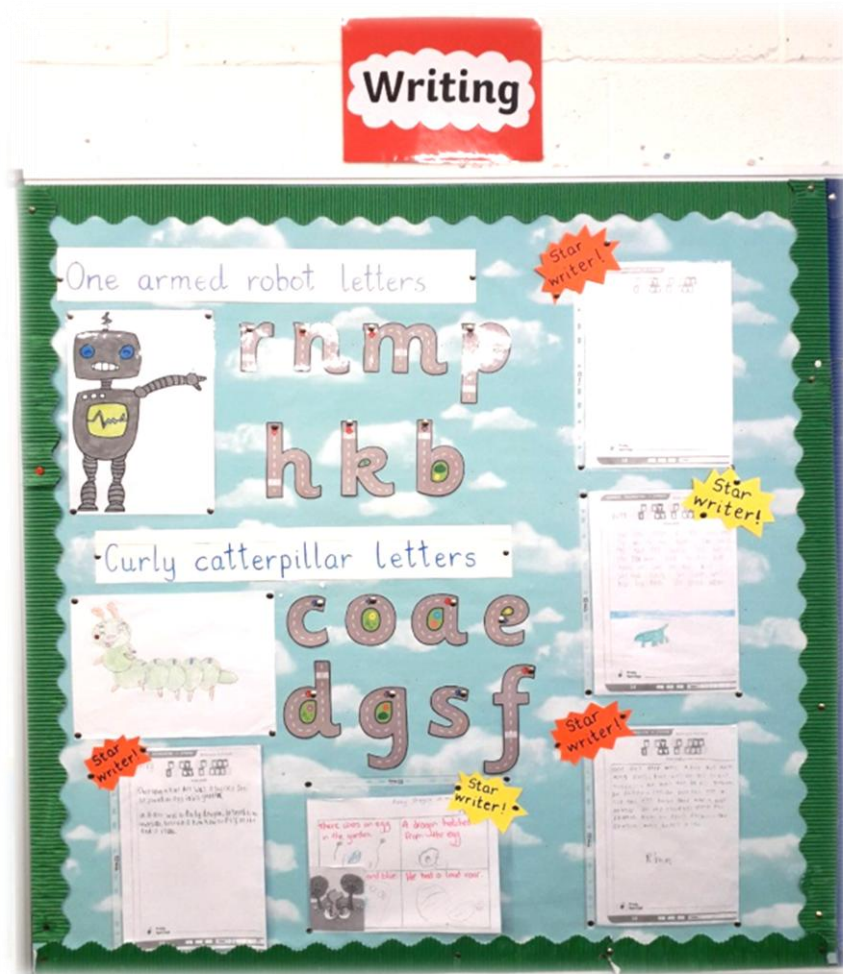
Figure 4: Handwriting Display Board

One child made a picture of the 'curly caterpillar' character from the group of letters that was covered that week in school. She made this at home in her spare time. I showed this to my critical friend. She said that this showed that the child was interested in what she was learning.

Figure 5: Child's Drawing

I also observed children taking more of an interest in their handwriting.

> Observation 4/4/19*: I noticed John* taking down homework into early finisher copy. This was after he took it down in his homework journal. I asked him why. He said he wanted to practise his handwriting.*

I was surprised by this observation, particularly as this child usually did not show much of an interest in his written work. Speaking to one of my critical friends, she commented that I was creating a culture of handwriting in the classroom. I realised that because I was discussing my research and handwriting with the children, I was creating more awareness of handwriting in the classroom.

4.3 Second Finding: Child-centred approaches for teaching handwriting allow greater opportunities for inclusion, student engagement and motivation

Looking at my teaching through the lens of a child, I endeavoured to change from my original didactic style to engaging in conversation with the children to find out what they thought about my approach to the teaching of handwriting. My critical friends helped me to see if I was being child-centred in my teaching.

The children developed a positive attitude towards handwriting and also writing in general.

> Reflective Journal Entry 12/3/19: *One thing that has really struck me since starting this project is how much the children are enjoying and taking an interest in writing in general. This week, three children came into me with different stories they had written at home. I was really delighted to see this. The fact that the children had the motivation to do this in their own time was fantastic. I decided to use the 'writer's chair' at the end of the day so the children could read the story to the rest of the class. Following this, the children have been more interested in writing stories in their early finisher copies. Although my aim was to assist handwriting, I was glad that the children see writing as something that is important and have an interest in it.*

> Reflective Journal 21/3/19: *Today I had a conversation with a few of the children at lunchtime. The children were talking about what they like doing in the evenings after school. Orla* said "Teacher, I like practicing my letters at home."*

> Reflective Journal Entry 14/3/19: *I have a child in my class that has difficulty with handwriting and taking things down from the board. I have had to put a number of supports in place, including altering the colour of the writing on the whiteboard to allow sentences to be clearer when taking material down and also drawing in thicker lines into his homework journal so he could write on the line. Since starting this intervention, I have noticed a huge improvement in this child's writing. He is also starting to develop more confidence and today said to me "Teacher I think this is my best writing this year". I am delighted that this intervention is giving this child confidence.*

I have learned to look more closely to the individual needs of the children and make adaptations to lessons or activities to help them achieve success.

> Reflective Journal Entry 22/3/19: *I was faced with a situation that involved an unexpected outcome. We were in the middle of a lesson about weather when something happened with a child that demanded my time and attention and I could therefore not continue with the lesson. I quickly handed out sheets of paper and got the children to draw a picture of their favourite type of weather. I dealt with the situation and then collected the sheets. Instead of putting them in a pile for the children to paste into their notebooks, I decided to staple them together and put the collection as a book in the library.* I added a comment in the journal later stating *This book has become very popular among the children.*

Although this incident was not directly related to handwriting, it gave me an idea for writing in the classroom. It was after this that I decided to make booklets of the children's writing and place these booklets into the classroom library. These included pieces the

children wrote at home or in school and were happy to place into the booklet. The children really enjoyed reading other children's work and it provided them with an incentive.

My critical friend in school challenged my thinking at the end of action research cycle one. I explained that I was using the checklist as a research instrument to assess the children's work. She asked me if I was including self-assessment during handwriting lessons, given that I was trying to live to my value of being more child-centred. I realised I was not using self-assessment so I decided to make a change of introducing success criteria, as mentioned in section 2.12.1. When I introduced the success criteria in research cycle two, it helped provide a focus for the children.

> Observation 20/3/19. *I had two success criteria today: 1. All letters touching the base line   2. Finger spaces. I observed Tony* rubbing out letter because it wasn't touching base line.*

This showed that by introducing success criteria into my practice, I was providing children with the opportunity to self-monitor their work. This is something that I feel confident about introducing into other areas in my practice. Not only does this give my teaching more structure, but I am also providing children with the opportunity to self-assess.

The children completed the fine motor activities in groups. As mentioned previously in this chapter, the children engaged in conversation during this time. However, although the children were doing this, they completed the activities individually. As the research cycle progressed, the children started to work together to construct different items.

During research cycle 2, it was observed that more children began working together to create different items.

Observation 13/3/19: *The children are working together in teams. Combining lace boards together with strings and straws.*

I provided additional materials for early finishers for handwriting. One resource that was provided was a wipe clean pocket with a guide for letters of the alphabet.

One child who had difficulty with handwriting commented that she found this helpful because the dot on each letter reminded her of where to start the letter :

> Observational Note: 12/3/19: *Lily* said she found the dot on the letters helpful because they reminded her where she needed to start the letter.*

Figure 6: Letter Formation Guide

Figure 7: Collaborative Work

Reflective Journal Entry 15/2/19*: I asked the children today what they taught of the activity centres.....One child said she liked them because she gets to talk to the people at her table in the morning. This was something I hadn't considered previously. The children used to take down homework first thing when they came into the classroom. Now that I think about this, I was not providing time for them to talk.*

By working together, the children learned to work as part of a team. According to Vygotsky (1978) learning involves social interactions. As they began to work together, they were able to help and learn from one another.

According to the NCSE (cited in DES, 2017) inclusion involves identifying and responding to the range of learners' needs. Overall, the active methodologies that were implemented for both research cycles allowed for inclusion. All the children were present when the different parts of the intervention were put in place. The children experienced a variety of different materials in order to develop fine motor skills. They received a multi sensory approach during handwriting lessons and support and guidance were provided during handwriting lessons.

I became more aware of the difficulties children may experience when writing and I altered my practice to allow for this. I placed left handed children beside one another or at the end of a desk so they were not hitting off another child's hand when writing. As mentioned previously, the children developed social skills during the fine motor stations, as they worked on pieces together and spoke to one another. The DES (2017) state that inclusive practice should include the promotion of a child's participation and active learning, in addition to educators creating a learning environment where children experience community.

Reflective Journal Entry 30/1/19: *Since starting my intervention, I have been better able to include a child in my class with special educational needs. In the mornings, I now do activity centres with fine motor skills first thing. I used to give this child fine motor skills to do while the rest of the children were taking down homework. When I think of this I was not living to my value of fairness. This child must have felt really excluded at this time.......*

...I have now created a more inclusive environment for this child..

...The verbal pathways have worked really well.....He is now able to say the verbal pathway as well as making the movement in the air with his hand.

This child was experiencing handwriting through active learning and also had an opportunity to work with other children to help develop his fine motor skills. I am now providing a more inclusive environment for this child.

The fine motor skill stations also allowed children with emotional difficulties time to settle in the morning and it allowed me time to check in with these students.

Reflective Journal Entry 20/3/19: *A child came in today really upset due to personal circumstances at home. As the activity centres are on at the beginning of the day, this allowed me a few minutes to talk with this child. She then went to her group and although she initially appeared upset, the other children asked her to join in their building activity. While taking a few observational notes, I looked back at this child and saw her laughing and talking with her peers.*

This taught me that not only did these fine motor stations help the children to develop their fine motor skills, but they also provided an opportunity for children to support one another and work together on a task. I learned from this that it is important to make time throughout the school day to check in with students that may have issues they need to share. Also, this has made me aware that providing more opportunities for the children to talk, play and work together is important for this reason also.

The children applied some of the approaches from handwriting lessons into other aspects of the school day.

Observation 5/4/19: *During spelling test, Tony* had to write letter 'd'. I could hear him repeat verbal pathway when he was saying the word.*

The new approaches I developed in my handwriting lessons were more child-centred, as the children were able to use these strategies when needed.

4.4 Third Finding: The implementation of fine motor skills can foster creativity in the classroom

Reflective Journal Entry 5/2/19: '*I have been blown away by the creativity of the children during the fine motor stations. Today, a child called me over to show that she had made 'Áras an Uachtaráin' out of lego. This was something she created using her own initiative. Two children came up to show me handbags they made using the treading boards and laces. I realise that I do not provide the children with enough time to be creative in the classroom. Although my main aim with introducing activity centres was to try and develop fine motor skills, I have learned that I should be providing opportunities for the children to develop their creativity on a regular basis. I do not believe I would have come to this realisation if I was not doing this research'*

Figure 8: Lego

Observation 13/2/19: 'Children with straws making barn. Recently covered the topic 'the farm'. Boys informed me there was a plough inside the barn.'
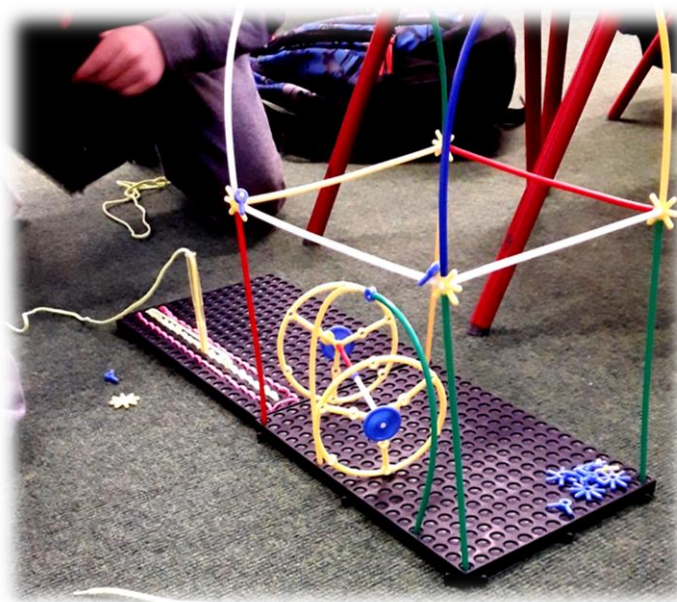
Figure 9: Barn with Plough

Observation 12/3/19: *Alice* came up to show me a handbag she designed with the threading board and strings.*
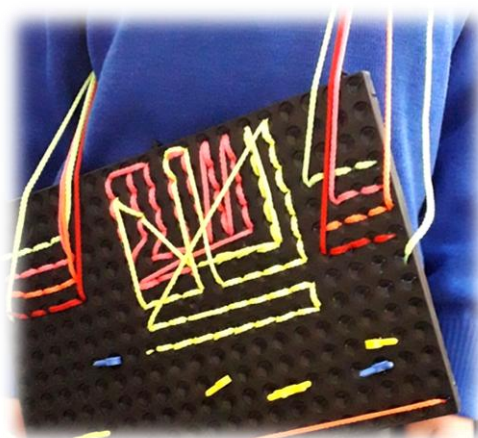
Figure 10: Handbag

Observation 13/2/19: '*Chat with Eimear*. I asked what she was making. She said she didn't know. Might be useful to put out some guided activities with play dough.*'

By this, I meant that I had to provide a guide for children who had difficulty creating their own ideas. I was not providing enough opportunities for the children to be creative prior to the intervention. This meant that some children struggled to come up with ideas on their own when provided with the materials for fine motor development.

Observation 26/3/19: *A group of six children were working on one of the Lego challenge cards. The children were working in two teams to see who could build the tallest skyscraper.*

Although I had provided the children with the challenge cards for this station, they created a game from this challenge. This further emphasises the importance of allowing children the materials and time to be creative in the classroom.

4.5   Results from Handwriting Checklist
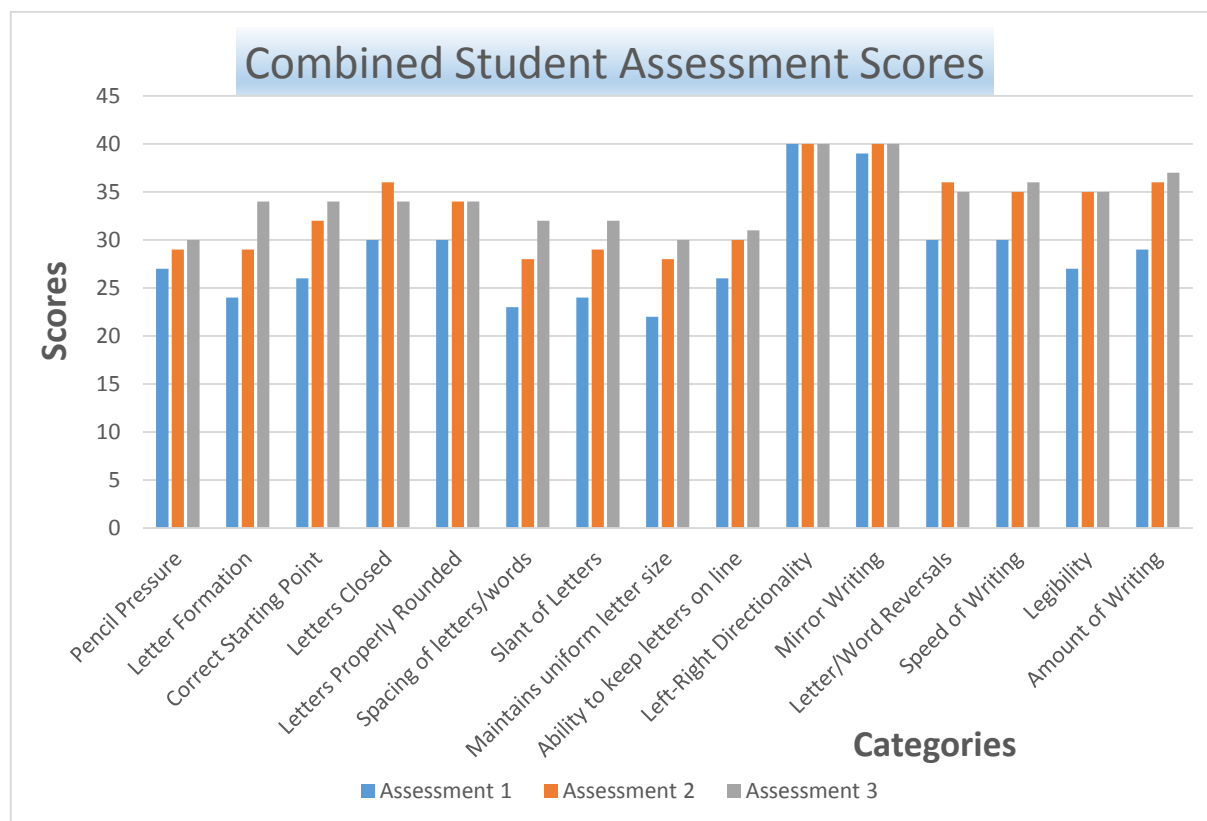
Figure 11: Student Scores

Individual scores for each student's handwriting were compiled and are documented in appendix g. Cumulative totals for the group were calculated to determine improvements and this is illustrated in the chart above.

4.5.1   Pencil Pressure

Shane, Harry, Jane Emily, Luke and Lucy had no issues with this. Tony made steady progress in this area, moving from 'fair' to 'good' at the end of cycle 2. Ben, Kate and Sally had some difficulty with this but improved after the intervention. This may have been due to poor pencil grip (DEE, 2001). It is possible that some children may need specialised pencil grips to help with pencil pressure. The DEE (2001) also suggest poor posture may contribute to this and therefore more activities to develop core strength should be introduced to the classroom.

4.5.2   Letter Formation

Shane improved from 'fair' to 'excellent'. Harry and Luke improved from good to excellent at the end of cycle 2. Ben improved from 'good' to 'excellent' after the intervention started. Tony and Sally improved from 'fair' to 'good' by the end of cycle 2. Jane, Kate and Emily improved from 'fair' to 'good' after cycle 1. Lucy's letter formation remained consistently at 'good' throughout.

4.5.3   Correct starting point

In each sample of handwriting collected before the intervention started, every child had difficulty with this area. Harry and Ben improved on this area in samples 2 and 3. Luke and Lucy improved in sample 3. Sally, Jane, Kate, Emily, Shane and Tony still have difficulty with this area.

Prior to starting the intervention, I observed that many of the children were forming their letters incorrectly, as they were not starting from the correct starting point. Lloyd (1998) states that it is important for children to develop correct letter formation, as if letters are formed incorrectly it can be difficult to correct. As the majority of the samples collected did not show correct starting point at letters suggests that the children may have developed a habit of forming certain letters incorrectly and therefore it is hard to resolve. Children often form letters correctly during explicit teaching of a letter, but when the primary focus of writing is not concentrated on letter formation, the incorrect over-learned motor sequence overrules and children use the incorrect formation of the letter (McMurray et al, 2009).

4.5.4   Letters closed

This was an area I noticed that some children in the class struggled with at the beginning of the school year. Lucy, Emily, Luke and Kate had no issues with this area. Ben and Shane improved from 'good' to 'excellent' at the end of cycle one. Sally and Tony improved

from 'fair' to 'good' after cycle one. Jane improved at the end of cycle 1 but reverted back for 2. This was the same for Harry. Although not all of the class had difficulty with this, the findings demonstrated that I needed to revise the closing of letters with the class.

4.5.5   Letters properly rounded

Some children in the class had difficulty rounding letters prior to the intervention, which resulted in poor legibility. Shane and Tony improved after the intervention moving from 'fair' to 'good'. Luke, Lucy, Harry and Ben had no issues with this. Jane and Sally remained consistently at 'good' throughout each cycle. Kate remained at 'fair' throughout. Emily made good progress with this, moving from 'fair' prior to the intervention, to 'excellent' after cycle one. Explicit instruction as recommended by Goves (2006) may be useful in assisting children with this area.

4.5.6   Spacing of letters/words

Sally improved from 'fair' to 'good' by the end of cycle two. Lucy moved from 'excellent' to 'good' back to 'excellent'. This may have been due to a lack of concentration when the second sample was taken. Emily and Ben moved from 'good' to 'excellent' after cycle 1. Kate made progress from 'fair' to 'good' at the end of cycle 2. Jane, Shane and Harry moved from 'fair' to 'good' at the end of cycle 1. Luke remained consistently at 'fair' throughout. Tony made steady progress from 'poor' to 'fair' to 'good' at the end of the research cycles.

4.5.7   Slant of letters

Harry, Luke and Shane remained consistent at 'good' throughout. Ben improved from 'good' to 'excellent' at the end of cycle one. Tony, Emily and Jane improved from 'fair' to 'good' at the end of cycle one. Kate really struggled with this area prior to the intervention, but improved from 'poor' to 'good' by the end of the research cycles. Sally improved from

'fair' to 'good' by the end of cycle two. Lucy improved from 'good' to 'excellent' by the end of cycle two.

4.5.8   Maintains uniform letter size

Sally, Lucy and Harry had no issues with letter size prior to starting the intervention.Emily, Jane, Ben, Tony, Luke and Shane improved. Kate made significant progress from 'poor' to 'good'.

I had to search for additional materials that were not previously part of my resource collection in order to provide extra guidance to the children. I found a 'ground, grass, sky' guide for assisting children with letter size and this proved to be helpful in assisting those that had difficulty with this.

4.5.9   Ability to keep letters on line

Sally remained consistently at 'fair' throughout. Lucy and Shane moved from 'fair' to 'good' at the end of cycle 1. Ben had no issues with this, remaining at 'excellent' throughout. Emily moved from good to excellent after cycle 1. Harry and Jane and Luke remained consistently at 'good' throughout. Tony struggled with this, he improved to 'fair' after cycle 1. I had to regularly assist Tony with this area. When taking down homework or writing in a lined copy, I had to draw thick black lines. This strategy enabled him to keep the writing on the line. It is possible that Tony might have the lines found in copies and workbooks difficult to see.

4.5.10 Left-Right Directionality

No children had any problems with left to right directionality in their handwriting.

4.5.11 Mirror Writing

Tony went from 'good' to 'excellent' with this. No other children had issues with mirror writing.

4.5.12 Letter / Word reversals:

Three children had no difficulty with letter reversals when writing. Sally reversed a significant number of letters in the first sample of handwriting. At the end of research cycle one, she had few letter reversals. In the third sample of writing, she did not have any letter reversals. Emily quite often reversed letters in her writing prior to beginning the intervention. There were no letter reversals in her second sample. However, there were some letter reversals in her third sample. Although this was the case, she made an overall improvement with her letter reversals. Kate stayed at the same level in terms of the amount of letter reversals in her writing. It is interesting to note that she missed two weeks of school during the intervention. Ben did not have any evidence of letter reversals until sample three. The letters he confused were 'b' and 'd'. Tony often reversed his letters prior to the intervention. He made improvements on this throughout the intervention. Luke had some 'b' and 'd' confusion prior to starting the intervention. He had no letter reversals in the rest of his writing. Shane sometimes reversed letters in his writing. This stayed the same throughout the intervention.

'B' and 'd' appear to be two letters that are commonly reversed in children's writing at this age. The DEE (2001) believe that letters that are regularly confused should be introduced in groups according to their formation. This way, children learn the letters as movements as opposed to visual shapes. This was why I chose to introduce the letters to the children according to their shape group. My main reason for this was due to my concern about the amount of letter reversals that were appearing in the children's work and I wanted to create more awareness around this. As can be seen in the checklists for the children's writing, there were fewer letter reversals in the samples after the intervention for the majority of children. It is important to highlight that not all letters were introduced to the children during the intervention. This was because I was 'reflecting-in-action' (Schön, 1983) and used what I was observing to inform my teaching. I realised that if the class were

struggling with the formation of a particular letter, I needed to revise this during the next handwriting lesson.

4.5.13 Speed of Writing

Luke, Harry, Jane, Sally and Kate had no issues with handwriting speed. Shane's, Lucy's and Emily's speed of writing improved from 'good' to 'excellent' after the end of cycle 1. Ben made good progress with handwriting speed, moving from 'fair' to 'excellent' after cycle 1. Every child made progress in this area after starting the intervention.

4.5.14 Legibility

In the case of Lucy, Harry and Ben, their legibility stayed the same. Sally, Kate, Jane and Tony moved from 'fair' to 'good' Emily and Luke progressed from 'good' to 'excellent'. Shane progressed from 'fair' to 'excellent' after cycle 1. The introduction of children's work to the handwriting display as mentioned in section 4.2, encouraged the children to work on the presentation of their writing. Having a purpose for writing provided motivation. Shane was eager to present his work on the display board.

4.5.15 Amount of writing:

Prior to the intervention, Shane started off with a small amount of writing. In the other two samples of writing taken at the end of both research cycles, he had produced more writing. Tony produced the same amount of writing prior to and at the end of research cycle 1. He produced more writing at the end of cycle 2. Before the intervention, Ben produced a small amount of writing. In the other two samples, he produced lots of writing. Jane maintained a similar amount of writing for each sample. Luke consistently produced a good amount of writing both before and after the intervention.

When the intervention started, the children started to write more frequently as part of their early finisher tasks. In particular, I noticed that Ben, Shane and Tony were more willing to write more than before the intervention. They appeared to have more motivation and when

I picked up their early finisher copies, I noticed that they had written several stories in these.

4.6 My own learning

I am teaching more in line with my values. I was too didactic in my teaching, now I am allowing more opportunity for creativity and collaborative work by using a different approach to teaching. I am engaging in more professional dialogue. Freire (1970) believed that teaching involved sharing knowledge through dialogue. This research study has encouraged me to talk to different teachers about my practice and seek different advice and opinions. I examined my practice through the lens of my colleagues, the children and through theory. My critical friends have challenged me and encouraged me to think of new approaches to different aspects of my teaching. This in turn has taught me to be more adventurous and to try innovative ways to make my practice more interesting and stimulating for my students.

I learned how better to integrate subjects to cater for creativity and play in my classroom. Although I always used a certain amount of child-centred approaches in my teaching I was experiencing myself as a living contradiction (Whitehead, 1989) in my delivery of handwriting lessons. I felt under too much pressure to get all the subjects covered and as a result, was not living in line with my values. I have come to the realisation that I can teach according to my values since I have learned how to better integrate handwriting with other subjects.

Through reflection, I realised that there were many parts of my intervention that did not go as well as I had intended. I used these as a learning experience. I identified time as an issue throughout the research cycles. I planned my handwriting lessons for the first slot after lunch time so that all children were present. However, this sometimes did not go to plan. Often I had to deal with issues that occurred on the yard and this interfered with the initial

time frame that I had set aside for the handwriting lesson. I also set time aside in the morning for completing my observations while the children were completing the fine motor activities. This time for taking observations was often interrupted, such as different adults coming into the room to discuss school-related matters. I found it difficult to find the time to reflect in the evenings. I came up with a strategy of taking a quick note of something if it inspired me during the day and then reflect on it at a time that suited. This is what Schön (1983) referred to as 'reflection-in-action' and 'reflection-on-action'.

There were some tasks at the fine motor skill stations where the children were not engaged or interested and consequently, this lack of enthusiasm resulted in misbehaviour. As a result, I made adaptations to some of the fine motor tasks and created more interesting and stimulating activities for research cycle 2.

At times during the handwriting lessons, the children found it hard to concentrate. This may have been due to personal circumstances for some children coming to school tired or may have been dealing with personal issues at home. I think it is important as a teacher to recognise that different factors can influence a child's ability to perform tasks.

The overall process of the research has taught me to reflect on my methods of teaching. Reflection has made me examine certain aspects of my teaching in order to make modifications when something is not working. This is something I resolve to do in the future.

4.7   Conclusion

To conclude, I have outlined the results of the data analysis for both qualitative and quantitative components of my research study. The conclusion and recommendations are discussed in the next chapter.

5   Chapter Five

Conclusion and Recommendations

5.1   Introduction

This chapter summarises the main findings of the study. I discuss how my research was of significance personally, professionally and to the wider educational context. I describe my claim to knowledge, in addition to acknowledging the limitations of the study. To conclude, I recommend further areas of study and identify how I intend to share my research.

5.2   Summary of Main Findings

Overall, one of my main findings was the importance of allowing creativity in the classroom. By providing children with the opportunity to engage with materials to develop fine motor skills, they were able to be creative. Creativity was not something I was trying to prove when I initially set out with the research project. However, I came to realise that it is important for educators to allow children experience this during school.

I have identified that using a child-centred approach to teaching is important. I have learned the importance of talking to the children and asking their opinions to develop my classroom practice. I have learned to provide more opportunities for the children to engage in conversation with one another.

In addition to this, creating a stimulating environment for the children is an important factor. I have the responsibility to create a supportive classroom environment and must ensure that I make it as child-centred as possible. This also means asking the children for their opinions on what would be useful for the classroom.

My own learning has evolved. I am now living more in line with my values and have an enhanced understanding of my practice. I know better how to approach teaching of handwriting in my classroom.

5.2.1 My claim to knowledge

I now claim how I can best provide an enriching experience for students when I am teaching handwriting in my classroom. Through carrying out self-study action research, I have shown myself that I am living more in line with my values of care and fairness. I have been reminded of my Froebelian values of a child-centred approach to teaching, learning through play and developing community in the classroom. Initially I was teaching in a didactic way and experiencing myself as a living contradiction (Whitehead, 1989). However, by examining my values and engaging in reflection I now realise that I can teach in a better way. I have learned more about my own practice and teacher identity, in addition to understanding and catering for the needs of my students.

5.3 Significance of the Research

5.3.1 Personal Significance

Since embarking on this journey of self-study action research, I have learned much about myself and my practice. I have learned to question myself and the way I do things. I am now engaging in more critical reflection and recognising its importance on my practice. I know that I will continue to learn. I am now living more in line with the values I hold. I am more open to different ideas and the opinions of others. I am beginning to look at living to my values in other aspects of my practice. For example, I am questioning if I am being child-centred and using active methodologies throughout other subject areas.

5.3.2 Professional Significance

My approach to planning has changed since this project. I took ideas that I thought worked and used them in my practice. However, I have come back to the value of a child-centred

approach to teaching. I am now taking what I learn from the children to inform my planning as opposed to following a pre-determined scheme in a textbook. I am listening to the children. I am taking their opinions and thoughts into consideration. I value the student's voice. Having used observation as one of my research tools, I realise the importance of observation and will dedicate more time in my practice to this. I value my classroom as a place for social learning to take place. I have moved from a didactic to a more social constructivist style of teaching. Through reflection, not only have I developed my pedagogical knowledge in the area of handwriting, but I have also come to understand why I teach the way I do. I 'know how' rather than 'know what'.

5.3.3   Students' Learning

I have learned that providing time for children to learn socially is important. In addition to this, I now realise the significance of providing opportunities in my classroom for children to be creative. The environment I create with materials is supportive but also displaying children's work in the classroom is equally important. Additionally, I have also come to realise that asking the children their opinions about supporting material in the classroom is important, given that the environment has a huge influence on their work.

5.3.4   Wider Educational Context

With the insights I have gained from doing this research study, I feel confident that I could help introduce a school policy for handwriting. With the implementation of the Primary Language Curriculum, I feel that schools will be more aware of how to approach handwriting in the classroom. By participating in self-study action research, I hope that I could also encourage others to facilitate this in their practice.

5.4   Limitations of the Study

As this was a study based on my own learning and practice, the research and findings apply to my context and the class I was teaching. My living theory was generated based on

this, meaning that it would be difficult to replicate this study or produce similar findings. Although the children's handwriting improved over the course of the research cycles, I must also be aware that children progress developmentally over time and this may also have had an impact on their handwriting. Given that the research was carried out with younger children, they may have been eager to please in their comments during the research cycles, rather than providing honest answers or thoughts. I am aware that my initial reflections were more descriptive rather than reflective. If my reflections were more reflective from the outset, this may have had a different outcome on the findings.

5.5 Further Recommendations

From carrying out this study, I realise that there is scope for development for further areas of study. These are areas that I would be interested in exploring in future.

I have seen firsthand how fine motor skills have had an impact on children's writing. This research study was carried out with first class pupils. However, it is mainly infant classes that participate in activities to develop these skills and is an area that is often overlooked with older classes. I would recommend that this area would be explored with all classes in primary school.

I would also be interested in exploring ways of developing creativity in the classroom. I was amazed at how creative the children were with the materials provided during the fine motor skill stations and feel it is an area that could be further developed in my classroom.

Many schools in Ireland are now introducing cursive handwriting from junior infants. My school has made the decision to introduce this from September. I would be interested in exploring the effects of introducing cursive handwriting from a young age.

5.6   How I will share my research

It is important that I share my research with others. The first step in sharing my research will be through my printed thesis. I also plan to share my research through dialogue. I regularly discussed my research study with my colleagues and offered insights about handwriting during staff meetings. I have also started a new job in a different school and have been asked to present my research to the staff. Additionally, I can also disseminate my findings over online platforms such as T-Rex and Twitter.

5.7   Final Reflection

Although I have come to the end of this particular study, my learning will not cease. I will continue the action research process in other areas of my practice, in order to live more closely in line with my values. I believe I have come a long way since first starting this study. I am more self-aware and I am looking at my practice in relation to the wider context of education. I know that my practice is more in line with the values that I hold. My identity as a teacher has become clearer to me as I now feel that I am teaching closer to my values as a Froebelian teacher. I have learned how reflection is important for all of this to take place and feel that towards the end of the research cycle, my reflections became deeper and I was able to engage better with this. I plan on bringing all of my experience with me to my new school. I realise that learning is a life-long endeavour and I must remain inquisitive and open to new ideas.

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Appendix A

Consent Forms

**Maynooth University Froebel
Department of
Primary and Early Childhood
Education**

**Roinn Froebel Don Bhun- agus
Luath- Oideachas
Ollscoil Mhá Nuad.**

Dear Parent(s)/Guardian(s),

I am a student on the Master of Education programme at Maynooth University. As part of my degree I am doing a research project. The focus of my research is based on creating a learning environment that supports the teaching of handwriting. Therefore, I will be using different strategies to teach handwriting to see if this leads to enhanced learning.

The data for this project will be collected using observations, children's work samples and a daily teacher journal.

The child's name and the name of the school will not be included in the thesis that I will write at the end of the research. Your child will be allowed withdraw from the research process at any stage.

All information will be confidential and information will be destroyed in a stated timeframe in accordance with the University guidelines. The correct guidelines will be

complied with when carrying out this research. The research will not be carried out until approval is granted by the Froebel Department of Primary and Early Childhood Education.

I would like to invite you and your child to give permission for him/her to take part in this project.

If you have any queries on any part of this research project feel free to contact me by email at: aoife.a.daly.2012@mumail.ie

Yours faithfully,

Aoife Daly.
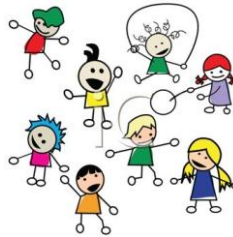
Child's name_____

I am trying to find out the best way to teach children handwriting in primary school. I would like try out new ways to teach this in the classroom to see if they will help you with your handwriting.

Would you be ok with that? Pick a box

| Yes | No |

I have asked your Mum or Dad or Guardian to talk to you about this. If you have any questions I would be happy to answer them. If you are happy with that could you sign the form that I have sent home?

If you change your mind after we start, that's ok too.

Maynooth University Froebel Department of Primary and Early Childhood Education

Roinn Froebel Don Bhun- agus Luath- Oideachas Ollscoil Mhá Nuad

PARENTAL CONSENT FORM

I have read the information provided in the attached letter and all of my questions have been answered. I voluntarily agree to the participation of my child in this study. I am aware that I will receive a copy of this consent form for my information.

Name of child:_____

Parent / Guardian Signature_____

Parent / Guardian Signature_____

Date: _____

Child's assent to participate

My parent/guardian has read the information sheet with me and I agree to take part in this research.

Child's name (Block Capitals) :_____

Child's signature:_____

Date:_____

Maynooth University Froebel Department of Primary and Early Childhood Education

Roinn Froebel Don Bhun- agus Luath- Oideachas Ollscoil Mhá Nuad.

Information Sheet

Parents and Guardians

Who is this information sheet for?

This information sheet is for parents and guardians.

What is this Action Research Project about?

Teachers on the Master of Education in the Froebel Department of Primary and Early Childhood, Maynooth University are required to conduct an action research project, examining an area of their own practice as a teacher. This project will involve an analysis of the teacher's own practice. Data will be generated using observation, children's work samples and a daily teaching journal. The teacher is then required to produce a thesis documenting this action research project.

What are the research questions?

How can I create a learning environment to support children's handwriting skills?

What sorts of methods will be used?

Children's work samples, observations and a daily teaching journal will be used to collect information for the action research project. The data will be collected in a sensitive, non-stressful manner.

Who else will be involved?

The study will be carried out by me Aoife Daly, as part of the Master of Education course in the Froebel Department of Primary and Early Childhood Education. The thesis will be submitted for assessment to the module leader Dr Bernadette Wrynn and will be examined by the Department staff. The external examiners will also access the final thesis.

What are you being asked to do?

You are being asked for your consent to permit me to undertake this study with my class. In all cases the data that is collected will be treated with the utmost confidentiality and the analysis will be reported anonymously. The data captured will only be used for the purpose of the research as part of the Master of Education in the Froebel Department, Maynooth University and will be destroyed in accordance with University guidelines.

Contact details: aoife.a.daly.2012@mumail.ie

Maynooth University Froebel Department of Primary and Early Childhood Education

Roinn Froebel Don Bhun- agus Luath- Oideachas Ollscoil Mhá Nuad.

Declaration by Researcher

This declaration must be signed by the applicant(s)

I acknowledge(s) and agree that:

a) It is my sole responsibility and obligation to comply with all Irish and EU legislation relevant to this project.

b) I will comply with Irish and EU legislation relevant to this project.

c) That the research will be conducted in accordance with the Maynooth University Research Ethics Policy.

d) That the research will be conducted in accordance with the Maynooth University Research Integrity Policy.

e) That the research will not commence until ethical approval has been granted by the Research and Ethics committee in the Froebel Department of Primary and Early Childhood Education.

Signature of Student: Aoife Daly

Date: 22/10/18

Appendix B

Fine Motor Activities

Research Cycle One	
Group One	**Play Dough** Freeplay with the play dough
Group Two	**Lego** Free play with the lego
Group Three	**Threading Boards and Construction Straws** Both of these were used as there was not enough of each for amount of children in the group
Group Four	**Peg Activities/ Multi-links** Using pegs to move pom pom balls into other basket Multi-Links free play

Research Cycle Two	
Group One	**Play Dough** Making sight words/initial blends/final blends with play dough
Group Two	**Lego** STEM (Science, technology, engineering and mathematics) challenges provided to use with Lego
Group Three	**Threading boards and construction straws** Pictures provided as stimuli for children (buildings, landmarks, furniture)
Group Four	**Cutting** Children cut patterns, shapes, letters printed on card

Appendix C

Gross Motor Activities

- Touching opposite knees while marching
- Touching opposite feet while marching
- Jumping Jacks
- Chair push ups
- Shoulder spirals (arms out to side and making circles)
- Standing on one leg
- Whole body shapes
- Game: Simon Says

Appendix D

Letter Groups

Name of Group	Leading Letter	Letters
One-armed robot letters	r	r, n, m, h, b, k, p
Curly caterpillar letters	c	c, a, d, g, q, o, e, s, f
Long ladder letters	l	l, i, u, t, y
Zig-zag monster letters	v	z, x, v, w, y, k

Appendix E

Writing Evaluation Checklist (Culligan , 2009)

Posture	Very good	Good	Fair	Poor
Trunk Stability	Very good	Good	Fair	Poor
Fine motor skills	Developed	Average	Low	Poor
Pencil Grip	Very good	Good	Fair	Poor
Pencil pressure	Normal		Too much	To Little
Steadying of paper	Always	Often	Sometimes	Never
Ability to 'chanel'	Very good	Good	Average	Poor
Ability to trace	Very good	Good	Average	Poor
Ability to copy	Very good	Good	Average	Poor
Letter formation	Very good	Good	Average	Poor
Correct starting point	Always	Often	Sometimes	Never
Letters closed	Always	Often	Sometimes	Never
Leading in/out	Always	Often	Sometimes	Never
Letters properly rounded	Always	Often	Sometimes	Never
Spacing of letters/words	Excellent	Good	Fair	Poor
Maintains spacing	Always	Often	Sometimes	Never
Slant of letters	Excellent	Good	Fair	Poor
Maintains uniform letter size	Always	Often	Sometimes	Never
Ability to keep letters on line	Excellent	Good	Fair	Poor
Using whole arm to write	Always	Often	Sometimes	Never
Near point copying	Excellent	Good	Fair	Poor
Copying from board	Excellent	Good	Fair	Poor
Left/Right Directionality and return sweep to next line	Always	Often	Sometimes	Never
Mirror writing	Always	Often	Sometimes	Never
Interspersing upper/lower case letters	Always	Often	Sometimes	Never
Letter/word reversals	Always	Often	Sometimes	Never
Uses eraser	Excessively	Frequently	Sometimes	Seldom
Speed of writing	High	Average	Low	Poor
Writes in different genres	Always	Often	Sometimes	Never
Willingness to write	High	Average	Low	None
Confidence in writing	High	Average	Low	None

Attitude to writing	Positive	Average	Poor	Negative
Amount of writing	High	Average	Low	None
Legibility	Very good	good	average	poor
Interest/Pleasure in writing	high	average	low	none
Readability of work	high	average	low	illegible
Vocabulary range	excellent	good	fair	Poor
Syntax	Excellent	good	fair	Poor
Grammar/Punctuation	Excellent	good	fair	Poor
Sequence of thoughts	Excellent	good	fair	poor
Descriptive vocabulary	excellent	good	Fair	poor
Spelling	Very good	good	plausible	bizzare

Appendix F

Adapted Writing Checklist

Category	Score			
Pencil pressure	1	2	3	4
Letter formation	1	2	3	4
Correct starting point	1	2	3	4
Letters closed	1	2	3	4
Letters properly rounded	1	2	3	4
Spacing of letters/words	1	2	3	4
Slant of Letters	1	2	3	4
Maintains uniform letter size	1	2	3	4
Ability to keep letters on line	1	2	3	4
Left-right directionality	1	2	3	4
Mirror writing	1	2	3	4
Letter/word reversals	1	2	3	4
Speed of writing	1	2	3	4
Legibility	1	2	3	4
Amount of writing	1	2	3	4

Appendix G

Results from Handwriting Checklist

STUDENT 1

Sally	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	2	3	3	1
Letter Formation	2	2	3	1
Correct Starting Point	2	2	3	1
Letters Closed	2	3	3	1
Letters Properly Rounded	3	3	3	0
Spacing of letters/words	2	2	3	1
Slant of Letters	2	2	3	1
Maintains uniform letter size	2	2	2	0
Ability to keep letters on line	2	2	2	0
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	2	3	4	2
Speed of Writing	3	3	3	0
Legibility	2	3	3	1
Amount of Writing	4	4	4	0
TOTAL FOR STUDENT	38	42	47	23.68%

STUDENT 2

Lucy	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	2	2	2	0
Letter Formation	3	3	3	0
Correct Starting Point	3	4	4	1
Letters Closed	4	4	4	0
Letters Properly Rounded	4	4	4	0
Spacing of letters/words	4	3	4	0
Slant of Letters	3	3	4	1
Maintains uniform letter size	3	3	3	0
Ability to keep letters on line	2	3	3	1
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	4	4	4	0
Speed of Writing	2	3	3	1
Legibility	4	4	4	0
Amount of Writing	2	3	3	1
TOTAL FOR STUDENT	48	51	53	10.42%

STUDENT 3

Emily	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	3	3	3	0
Letter Formation	2	3	3	1
Correct Starting Point	3	3	3	0
Letters Closed	3	3	3	0
Letters Properly Rounded	2	4	4	2
Spacing of letters/words	3	4	4	1
Slant of Letters	2	3	3	1
Maintains uniform letter size	2	3	3	1
Ability to keep letters on line	3	4	4	1
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	2	4	3	1
Speed of Writing	3	4	4	1
Legibility	3	4	4	1
Amount of Writing	3	4	4	1
TOTAL FOR STUDENT	42	54	53	26.19%

STUDENT 4

Kate	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	2	3	3	1
Letter Formation	2	3	3	1
Correct Starting Point	2	3	3	1
Letters Closed	3	3	3	0
Letters Properly Rounded	2	2	2	0
Spacing of letters/words	2	2	3	1
Slant of Letters	1	2	3	2
Maintains uniform letter size	1	2	3	2
Ability to keep letters on line	3	3	4	1
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	3	3	3	0
Speed of Writing	4	4	4	0
Legibility	2	3	3	1
Amount of Writing	4	4	4	0
TOTAL FOR STUDENT	39	45	49	25.64%

STUDENT 5

Jane	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	3	3	3	0
Letter Formation	2	3	3	1

Correct Starting Point	3	3	3	0
Letters Closed	3	4	3	0
Letters Properly Rounded	3	3	3	0
Spacing of letters/words	2	3	3	1
Slant of Letters	2	3	3	1
Maintains uniform letter size	2	3	3	1
Ability to keep letters on line	3	3	3	0
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	4	4	4	0
Speed of Writing	3	3	3	0
Legibility	2	3	3	1
Amount of Writing	3	3	3	0
TOTAL FOR STUDENT	43	49	48	11.63%

STUDENT 6

Harry	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	3	3	3	0
Letter Formation	3	3	4	1
Correct Starting Point	3	4	4	1
Letters Closed	3	4	3	0
Letters Properly Rounded	4	4	4	0
Spacing of letters/words	2	3	3	1
Slant of Letters	3	3	3	0
Maintains uniform letter size	3	3	3	0
Ability to keep letters on line	3	3	3	0
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	3	4	4	1
Speed of Writing	3	3	3	0
Legibility	3	3	3	0
Amount of Writing	2	3	3	1
TOTAL FOR STUDENT	46	51	51	10.87%

STUDENT 7

Tony	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	2	2	3	1
Letter Formation	2	2	3	1
Correct Starting Point	2	3	3	1
Letters Closed	2	3	3	1
Letters Properly Rounded	2	3	3	1
Spacing of letters/words	1	2	3	2

Slant of Letters	2	3	3	1
Maintains uniform letter size	1	2	2	1
Ability to keep letters on line	1	2	2	1
Left-Right Directionality	4	4	4	0
Mirror Writing	3	4	4	1
Letter/Word Reversals	2	3	3	1
Speed of Writing	3	3	4	1
Legibility	2	3	3	1
Amount of Writing	3	3	4	1
TOTAL FOR STUDENT	32	42	47	46.88%

STUDENT 8

Ben	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	3	3	3	0
Letter Formation	3	4	4	1
Correct Starting Point	3	4	4	1
Letters Closed	3	4	4	1
Letters Properly Rounded	4	4	4	0
Spacing of letters/words	3	4	4	1
Slant of Letters	3	4	4	1
Maintains uniform letter size	3	4	4	1
Ability to keep letters on line	4	4	4	0
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	4	4	3	-1
Speed of Writing	2	4	4	2
Legibility	4	4	4	0
Amount of Writing	2	4	4	2
TOTAL FOR STUDENT	49	59	58	18.37%

STUDENT 9

Luke	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	4	4	4	0
Letter Formation	3	3	4	1
Correct Starting Point	3	3	4	1
Letters Closed	4	4	4	0
Letters Properly Rounded	4	4	4	0
Spacing of letters/words	2	2	2	0
Slant of Letters	3	3	3	0
Maintains uniform letter size	3	3	4	1
Ability to keep letters on line	3	3	3	0

Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	3	4	4	1
Speed of Writing	4	4	4	0
Legibility	3	4	4	1
Amount of Writing	4	4	4	0
TOTAL FOR STUDENT	51	53	56	9.80%

STUDENT 10

Shane	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	3	3	3	0
Letter Formation	2	3	4	2
Correct Starting Point	2	3	3	1
Letters Closed	3	4	4	1
Letters Properly Rounded	2	3	3	1
Spacing of letters/words	2	3	3	1
Slant of Letters	3	3	3	0
Maintains uniform letter size	2	3	3	1
Ability to keep letters on line	2	3	3	1
Left-Right Directionality	4	4	4	0
Mirror Writing	4	4	4	0
Letter/Word Reversals	3	3	3	0
Speed of Writing	3	4	4	1
Legibility	2	4	4	2
Amount of Writing	2	4	4	2
TOTAL FOR STUDENT	39	51	52	33.33%

COMBINED STUDENT TOTALS	Assessment 1	Assessment 2	Assessment 3	Overall Change Start - Finish
Pencil Pressure	27	29	30	3
Letter Formation	24	29	34	10
Correct Starting Point	26	32	34	8
Letters Closed	30	36	34	4
Letters Properly Rounded	30	34	34	4
Spacing of letters/words	23	28	32	9
Slant of Letters	24	29	32	8
Maintains uniform letter size	22	28	30	8
Ability to keep letters on line	26	30	31	5
Left-Right Directionality	40	40	40	0
Mirror Writing	39	40	40	1
Letter/Word Reversals	30	36	35	5
Speed of Writing	30	35	36	6
Legibility	27	35	35	8
Amount of Writing	29	36	37	8