UNIVERSITY OF CAMBRIDGE
Faculty of Education

ISSN 2043-8338

Journal of Trainee Teacher Education Research

JoTTER: Volume 2 (2011)

Placing the left-handed child: a study of the implications of being a left-handed child within the primary classroom

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Abstract

This study reports the findings of a small-scale research study into the implications of being a left-handed pupil in the primary classroom. In doing so, it explores the implications of brain laterality on handedness. It then considers the lack of adequate school equipment available to left-handed pupils in the primary classroom and the impact that this can have upon pupil's self-esteem. This is followed by a discussion of the handwriting instruction that is offered to left-handed pupils. The study involved thirty year 3 pupils from a Cambridgeshire primary school. Classroom research was conducted in the form of laterality tests, handwriting and equipment exercises and observational studies. The findings raise awareness to the lack of support for left-handed pupils in the primary classroom and the need for the implementation of a left-handed policy within schools in order to address this. Furthermore, they highlight the importance of educating teachers about strategies to support left-handed pupils in order to increase pupils' self-esteem.

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Emily Hayes

The current statistic of approximately ten percent of the world's population as naturally left-handed affirms the presence of left-handed pupils within the primary school. Indeed, the preference of many to use their left-hand as their dominant hand is nowadays seen as acceptable practice and is thus rarely dwelt upon. However, whilst being left-handed has not been proven to have any negative implications upon a pupil's academic abilities, it has a significant affect upon the primary classroom in terms of the ways in which pupils access learning. Indeed, Clarke states that "left-handers need help at an early stage, along with regular and continued monitoring of their progress and development" (1993, p.1). Therefore an awareness of the differing strategies used by left-handed pupils within the classroom is important for teachers to recognise in order for them to support and aid their needs.

My own school experiences have led me to notice that left-handed pupils often struggle more than their peers in terms of handwriting and utilising certain aspects of the classroom environment. These observations were particularly affirmed during my recent seven-week school placement with a year three class in a school which I will henceforth refer to as Ridge Primary School. Upon initially researching the issue, it was immediately evident that there is a lack of substantial research and, indeed, of awareness into the position of left-handed pupils within the primary classroom. Therefore, my research will draw upon both my observations at Ridge Primary School, as well as the reflections of left-handed pupils in order to suggest the implementation of a left-handed policy within all primary schools as a way of educating teachers, parents and pupils about handedness and offering a fundamental structure of strategies which may go some way to rectifying the current situation.

The origins of handedness within educational literature

Historically, left-handed pupils have experienced a great deal of prejudice within the primary classroom, most noticeably during the Victorian period. Based on their fear of the unknown, many societies associated the word 'left' with negative connotations such as evil, unlucky or sinister, thus contrasting with the word 'right' which stood for correctness, authority and justice (Clarke, 1993). Although these preconceptions are no longer prevalent today, researchers have yet to reach a conclusive answer as to why people are left-handed. This has resulted in a great deal of ambiguity, which is heightened by conflicting research into the origins of handedness.

There is an argument that hand orientation is predetermined and developed in the foetus. Clark writes that "genetic studies have revealed that the development of handedness preference has a hereditary basis" (1974, p. 13). Milsom agrees, stating that "left-handedness is a trait we are born with" (2008, p.10). Both Milsom and Clarke feel that the chances of being left-handed are greatly increased if either of your parents are left-handed. Manus agrees that left-handers are more likely to have left-handed children than right-handers. He explains that "if one parent is left-handed the chance of having left-handed children is increased 2.05 times, and if both are left-handed they are 2.75 times more likely to have a left-handed child than two right-handed parents" (2002, p.157). However, it is only recently that research has proven that handedness is likely to be predetermined. Indeed, in 2007, scientists at Oxford University discovered a link between the gene LRRTM1 and left-handedness which is thought to influence the dominant side of your brain. They found that the gene caused the right-side of the brain to control specific functions, resulting in the carrier being left-handed. In their research findings, the scientists stated that "LRRTM1 is the first genetic influence on human handedness to be identified" (Francks et al, 2007).

However, academic literature also offers a counter argument which suggests that handedness is influenced by social, environmental and developmental factors and is therefore not determined until a child's early years. This is reflected in the fact that toddlers experiment with both of their hands up until around the age of three when they will decide on a preference. Johnson's research captures this sense of ambiguity in it's inability to locate the origins of handedness; "using a large, nationally representative sample of young children, we find that the probability of a child being left-handed is not significantly related to child health at birth, family composition, parental employment, or

household income" (Johnson et al, 2009). However, it is certain that a child has decided on their hand preference by the time that they begin primary school.

Placing the left-handed child within educational literature

The implications of being a left-handed pupil in the primary school affects much more than the hand you write with (Clark, 1974). Scientists have proven that the brain is 'cross-wired' so that "the left side of the brain controls the right side of the body and the right hemisphere controls the left side of the body" (Clarke, 1993, p. 2). Therefore, left-handed pupils have a greater dominance of the right side of their brain, thus influencing the way that they think and process information. The research of Blakeslee illustrates the thought that whilst right handed people process information via a 'linear sequential' method in which one thread must be completely processed before the next can start, left-handed people process information via a 'visual simultaneous' method in which several threads can be processed simultaneously (1980). As such, they comprehend an idea by creating a picture in their mind and are therefore good at multi-tasking, creative pursuits and have a higher level of emotional literacy.

Literature exploring handedness is unanimous in agreeing that like any aspect of a child's development, pupils require support in order to progress with using their preferred hand orientation proficiently. Assistance and direction with handedness is particularly necessary for pupils in the formative years of primary school. However, Clarke explains that it is increasingly evident that "many problems left-handers find in later life are caused by lack of attention to certain areas in their early schooling" (Clarke, 1993, p. 1). This lack of awareness is still just as topical today as it was when Clarke was writing in 1993 and appears to stem from a lack of teacher understanding and consequently of support for left-handed pupils. Indeed, a lack of awareness into the functioning differences between left and right-handers can result in many unnecessary and avoidable difficulties for left-handed pupils within the primary school classroom which can then continue into later life if not adequately addressed. The effects of this can range from a pupil's frustration and anxiety at their inability to perform actions that right-handers may find easy, to stuttering and verbal irregularities which can stem from a lack of guidance and a suppression of their natural preferences for using their left-hand (Clarke, 1993). Clark agrees that "certain periods appear to be critical with

regard to speech development, and attempts to change handedness at these ages may have adverse effects on speech" (1974, p. 23). However, it is important to note that speech impairment is not a direct result of a change of handedness, nor will it necessarily occur.

Research has shown that left-handed pupils would also benefit from guidance into using school equipment such as stationary implements and sports equipment. Most pens are designed for right-handers with fountain pens being particularly problematic as their nibs are shaped for right-handed use. Thus, left-handed pupils will struggle to use them if they are not recommended to use a left-handed fountain pen. Clarke explains that "the use of a ball-point pen with relatively quick drying ink can help to alleviate many of these problems" (1993, p. 10). Similarly, writing in pencil during the first few years of primary school also prevents the occurrence of such problems in relation to handwriting. Furthermore, each computer mouse within the primary classroom is designed for the right-hand and is often positioned on the right-hand side of the keyboard, therefore resulting in difficulties for left-handed pupils. Again, guidance and instruction for left-handed pupils could prevent this. In addition, whilst many left-handers excel at sport due to a "heightened sense of spatial awareness and imagination" (Clarke, 1993, p. 23), they often have to struggle with right-handed equipment which is unsuitable to fit their needs. "In order to obtain the best results it is important to allow children to work with their preferred side of their body for sport activities, which will provide them with the greatest control and co-ordination" (Clarke, 1993, p. 23). However, left-handed pupils are often unable to do so whilst at primary school due to a lack of appropriate equipment and therefore must learn to adapt and use both sides of their brain in order to excel in situations such as this. This skill is transferable to using both sides of their body when playing sport.

In order to combat this, "left-handers need help at an early stage, along with regular and continued monitoring of their progress and development" (Clarke, 1993, p. 1). Without this help, left-handed children will naturally blame themselves for these issues rather than viewing them as part of the wider circumstances of being left-handed. Leading left-handed experts Lauren and Keith Milsom founded The Left-Handers Club which runs numerous campaigns and websites in an attempt to draw awareness to this. The club recently carried out a questionnaire of the school experiences of over one thousand participants in terms of handedness. Their results revealed that "only ten percent of students have received any specific advice on left-handed writing techniques from their teacher"

(Anything Left-Handed, 2009). The survey also found that only forty-four percent of participants had left-handed scissors available to them in their school classroom. From these results, their partner website published a press release, concluding that "there is a significant gap in teachers' knowledge relating to their left-handed pupils. Far too few teachers are aware of their left-handed students' needs and crucially do not know how easily these needs can be met" (Left-handed children, 2006). Therefore, it is evident that left-handers pupils feel that they need support and guidance from their teachers in order to learn to work in a way which may not feel entirely natural to them.

My research design

My educational research is concerned primarily with pupil's perspectives on the position of left-handed pupils in the primary school. In exploring this subject, I am particularly interested in pupil awareness and attitudes toward handedness. I intend to then use their perspectives in order to ascertain how real the problem of handedness is within the primary classroom and to suggest strategies which will aid left-handed pupils. I feel that this research will be valuable to me as a teacher in terms of developing my classroom practice as it will enable me to pre-empt the problems that left-handed pupils may face and therefore to offer equal support to everyone in the class. All of my research was carried out on a year three class of thirty pupils, all aged seven or eight. Out of the thirty pupils, twenty-four of them were right-handed whilst six of them were left-handed. All thirty pupils were involved in the general parts of my research on laterality whilst the six left-handed pupils assisted with my additional research into equipment and handwriting.

Centering my research around both structured and naturalistic observations, my research adopts three parts. The first section of my research involved all thirty pupils in the class and is concerned with laterality. I required all pupils to participate in a laterality test which consisted of a series of nine exercises which pupils were asked to perform immediately. Their initial, instinctive responses were crucial for this test in order to ensure the most accurate results. Therefore, I presented the exercises to them as a game and did not tell them the reasoning behind the exercises until after they had completed them so as not to influence them. The research was carried out with pupils in groups of five so that I could give them clear instructions and observe their reactions. My results were

initially recorded in a grid and colour coded to indicate left and right-handed responses. I then displayed my results in a variety of pie charts and bar graphs in order to illustrate my points more clearly and to see their implications in terms of handedness and the classroom environment. Indeed, Bell suggests that these charts and graphs are effective at indicating proportions of students, particularly in relation to research such as the design of this study (1999). The test follows on from my findings in academic literature about brain lateralization and was taken from the Anything Left-handed website. It was developed by the Left-Handers Club and was designed to raise awareness to handedness in time for 'National Left-handers Day'. However, I chose to use the test as its simple structure of questions was particularly applicable to primary school pupils and because of its effectiveness in highlighting the fact that almost everyone exhibits some aspects of left lateralization that may have implications upon them in the primary classroom.

Both the second and third parts of my research on school equipment and handwriting were based around an observational study. I considered using questionnaires or interviews as a way of ascertaining left-handed pupils reactions to these subjects but ultimately favoured observations because, as Bell agrees, "direct observations may be more reliable than what people say in many instances" (1999, p.156). For both of the sessions, pupils were provided with relevant activities produced by the Left-Handers Club which were aimed at left-handed primary school pupils. I was primarily concerned with observing the strategies that pupils employed in order to complete the activities and the interactions between the pupils as they did so (Pollard, 2005). Their interactions were informally recorded in note form and have been used to back up many of my arguments throughout the research sections of my report. Throughout my observations, I ensured that my participation did not go beyond verbally instructing the pupils at the start of each activity, thus ensuring that any interactions between them were natural and unbiased or influenced by myself. My equipment research involved an observation of left-handed pupils as they tried out various techniques when using scissors in order to see the effectiveness of the equipment and of their strategies for using it. I then assessed the left-handed pupil's handwriting and offered them simple strategies, which they could implement in order to significantly aid them with their handwriting.

The integrity of ethics in relation to my research

In order to carry out my research, I completed an ethics consent form and also obtained written permission from the head teacher of the school in question. Their permission allowed me to collect my data without having to send out a parental consent letter detailing my research intentions. The letter assures the school that I would respect the privacy of each pupil, ensuring that they remained anonymous and that their responses would be confidential. All data collected has been coded. Therefore, pupil's names have been changed within the context of my research and I have chosen to refer to my placement school as Ridge Primary School. I would like to acknowledge the school for their help and support and for granting me full permission to carry out my research.

Their permission also enabled me to involve a year three class of thirty pupils in my research. Within this class, there was a mixture of abilities, including a special educational needs pupil and a gifted and talented child. However, I am aware that my research only involves a small selection of pupils and therefore that my results may not be the norm, neither may they be typical of all primary schools. Therefore, if I had more time then I would have benefited from carrying out my research with a greater number of left-handed pupils, and from involving pupils of different age-ranges throughout the primary school in my research in order to ensure more accurate results and to gain a greater understanding of how problems with handedness are influenced by a child's age.

Left-handedness and Laterality

The preference of a child to be right or left-handed also has significant implications in terms of their laterality. Laterality is directly related to the side of your brain which has greater dominance and affects the way that we think and move. Scientists presume that left-handers have a greater left-sided dominance whilst right-handers are controlled more by their right side. However exhibitions of crossed-laterality demonstrate the fact that our dominant hand is not always consistent with our body's laterality. For example, Clark explains that "the number of persons showing consistent preference for one hand or the other appears also to vary for different activities and to be greatest in the more skilled and more often practised tasks" (1974, p. 7). Indeed, many left-handed pupils may prefer to use their right-hand or the right side of their body for various other tasks, and vice versa.

In considering laterality and how it corresponds with handedness, I involved thirty pupils from Ridge Primary School in a laterality test in order to ascertain whether their brain laterality corresponded to their handedness and to the dominant sides of their body. The purpose of the research was to discover whether right-handed pupils could be at a similar disadvantage to left-handed pupils within the primary classroom if they exhibit signs of crossed-laterality. If this is the case then it has significant implications in terms of the support and guidance that pupils receive from their teachers and in terms of the provision of left and right-handed school equipment. The test consisted of nine child-friendly questions, which can be found in Appendix A, and pupils responses were recorded in a table, a sample of which is shown in Appendix B.

Upon analysing my results, I feel that they are fairly representative of the population due to the fact that the class had a largely right-handed bias due to its composition of twenty-six right-handed pupils and six left-handed pupils. The results of all nine questions are displayed in a bar chart in Appendix C with the blue bars indicating the right-handed pupils whilst the red bars represent the left-handed pupils. Whilst my results were to be expected in that the indicated a right-handed bias in the majority of actions that the pupils performed, it is interesting to see the high proportion of pupils who showed a left-handed preference in many of the activities. I was particularly interested to find that the proportion of pupils who showed a preference for using the left side of their body in many of the questions was very high, indicating high levels of crossed laterality amongst right-handed pupils. This suggests that they may benefit from instruction in applying left-handed strategies within the primary classroom. Indeed, the fact that so many pupils chose to use their left hand to count their fingers is interesting as it reflects the control that they have with that hand.

My research on laterality has also revealed some interesting results in terms of the dominant eye that pupils chose to use. Eye preference is also thought to be established in children before they begin school (Clark, 1974), and is not thought to be linked to handedness. Pringle's research shows that 25-35% of the population are left-eyed and that "well over one-third of the population shows some left-preference" (as cited in Clark, 1974, p.11). My own research also reflects the fact that a high proportion of pupils are left-eyed, reflected in the pie charts depicted in Appendix D. My first pie chart includes all thirty of the children within the class, regardless of their handedness. However, it is immediately evident that a higher proportion of the class are left-eyed than left handed. Indeed, my statistics reveal that almost half the class show a preference for using their left-

eye as their dominant eye. In order to further demonstrate the display of crossed laterality within right-handed pupils, the second pie chart only includes right-handed pupils. Again, the high statistic of left-eye dominance indicates that nearly half of the right-handers involved have a dominant left-eye. Clarke also discusses this statistic, claiming that there is a "much higher instance of left-eye and left-footedness (rather than just left-handedness) in the population" (1993, p. 3). This impacts upon their learning because pupils who are left-eyed will have a tendency to read backwards, from right to left rather than the correct way. The implications of this are discussed in greater detail in the following sections of my research and ultimately suggest that all pupils would benefit from guidance in order to prevent processing problems in subjects such as literacy. Overall, the test has revealed to me that no pupil is completely right or left-handed and therefore that schools must do more to assist pupils with strategies for this. It also indicates the importance for schools to have adequate equipment for both right and left-handers because it is likely that right-handers might demonstrate a preference for using left-handed equipment.

The provision of left-handed equipment within the primary classroom

Clarke acknowledges that although it can be frustrating, living in a 'right-handed world' does not cause too many problems for left-handers (1993). However, one of the most recurring problems is the lack of suitable equipment produced for left-handed people as a result of the fact that many of our tools are created and designed for a right handed bias. Clarke explains that "the introduction of mass production meant individuals no longer had tools hand made in their preferred configuration and tools were designed and manufactured for the right-handed majority" (1993, p. 7). She also states that "manufacturers have argued that it is not commercially viable to adapt their designs for such a 'small' percentage of the population" (1993, p. 7). Thus, this makes everyday tasks a lot more labourious for left-handers who have to develop strategies to suit their needs; "instead of adapting the tools, it was the left-handed people who were forced to change hands or suffer the consequences" (Clarke, 1993, p. 7).

This lack of appropriate equipment is particularly problematic in the primary school classroom as pupils are at a formative age in which they are learning to adapt to using such equipment and need to be taught to do so effortlessly and correctly. Whilst primary schools do their best to provide for

the percentage of left-handers in each class, it is everyday equipment such as pens, scissors and PE equipment, which often present the greatest right-handed bias. Upon discussing such items with the left-handed pupils in my placement school, it became evident that they felt that there was a lack of understanding amongst their peers about left-handed equipment. One pupil stated that "we need to use the left-handed scissors to do our cutting out but right-handed people always take them because they don't understand that they're different" (Joe). In particular, they all expressed frustration at the fact that they struggled a lot more with their cutting out in relation to many of their peers.

As such, I set up my research on cutting out with the premise of discovering how real an issue the absence of left-handed scissors and of instruction for using them is for left-handers in the primary classroom. Again, the feelings of frustration regarding this were immediately apparent as I was explaining the task to the six left handed pupils, with one of them exclaiming that "I'm rubbish at cutting out. I don't want to do this" (Felicity). Each pupil affirmed that they had never had any correspondence with the school regarding the fact that they were left-handed and therefore had not been given any support to counteract the negative feelings that they associated with everyday tasks such as cutting out. Whilst this can be viewed in a positive light in that the pupils did not appear to regard a great distinction between themselves and their right-handed peers, it was evident that they would benefit from some assistance. Indeed, upon firstly providing each left-handed pupil with a star shape and a pair of right-handed scissors and asking them to cut it out, I was surprised to find that only one of the pupils pointed out to me that "we're not supposed to use these scissors" (Joe). Meanwhile, the other pupils struggled with them without asking for a left-handed alternative. As such, all pupils complained that it was hard work with right-handed scissors and that they would not be able to make the lines look neat. This is reflected in their results, shown in Appendix E. However, this is inevitable as right-handed scissors are moulded for a right-hand and operate in such a way that "by holding most scissors in the left-hand, the blade cuts away from the work and the cutting line is obscured so a real left-handed scissor has the blades reversed as well" (Clarke, 1993, p. 22). As a result of this, the left-handed pupils exhibited a tendency to give up and stop trying as it was too difficult and they would not achieve the results that they expected.

I then provided all pupils with exactly the same shape but a pair of left-handed scissors, this time instructing them to cut in a clockwise direction as this would help them to line up the blade with the black line. It was evident that if I had not told them this, many pupils would have cut in an anti-

clockwise direction which would have resulted in the blade obscuring the line in which they were cutting. Immediately, pupils found this quicker and easier with one pupil saying "this is fun. I'm going to make this star a lot neater for you" (Ellie). Their results (Appendix F) reflected their ability to complete this task more successfully with the correct equipment and some brief guidance from myself. Following this, pupil were given a circle shape to cut out in a clockwise direction and were verbally remind to turn their paper as they cut it in order to make it easier for them and to cut in long motions rather than short chops in order to make their edges neater. Upon following this direction, almost all pupils produced accurate circle shapes, with the exception of one pupil who "thought we had to cut out the lines as well" (Felicity). Their final tasks consisted of cutting out a square shape and a snake shape without any instruction. Their results affirmed that they had learnt to adopt the strategies that I had taught them when cutting out, thus producing neater work. They also expressed a greater level of enjoyment and were able to complete the task with less concentration than previously shown. Therefore, my research demonstrated to me that this guidance was simple yet effective in aiding left-handed pupils with using equipment within the primary classroom and that the pupils agreed that they benefited from such support.

Supporting left-handed pupils with handwriting

The final part of my research was concerned with how left-handed pupils viewed the process of handwriting and any resulting difficulties relating to their handedness. Literature on handedness reveals that left-handed pupils often struggle with the process of writing from left to right during their early years of schooling as their greater right-brain dominance prefers to process information from right to left. This is apparent even in left-handed toddlers who will prefer to turn things anti-clockwise than clockwise. However, my research into laterality demonstrates that this may also be an issue for any right-handers who exhibit crossed lateral preferences. Writing in a left to right direction is challenging for left-handed pupils as their left-hand is unable to remain ahead of the writing, thus obscuring what has just been written (Clark, 1974). Therefore, it is unsurprising that left-handed pupils are prone to writing slower than the rest of their peers as they are so conscious of the writing process. Clark explains that "left-handers seem to remain conscious of the writing movement for a long time; they have accordingly jerky, effortful movements when writing" (1974, p. 32). As such, "most left-handers, given time, can write neatly; their most common failing is their

inability to acquire the necessary speed to meet everyday requirements" (Clark, 1974, p. 31). Clarke summarises that,

> "a lack of confidence can still occur if a child is allowed to use their left hand but without any guidance. If the child is left to "work it out for themselves", they will try to copy the teacher and fellow pupils, frequently developing an extremely awkward and uncomfortable writing style"
>
> (1993, p. 9).

As a result, they will blame themselves rather than their lack of appropriate equipment and support, leading to a lack of self-esteem and feelings of inadequacy. Indeed, Clark elaborates that "little specific guidance in writing is given to left-or indeed to right-hand writers by teachers" (1974, p.31).

This was apparent from the responses of the left-handed pupils in my placement class, all of whom affirmed that they had never had any instructions into left-handed handwriting strategies that they could apply. Indeed, in 2006, research carried out on 260 teachers in Manchester found that "fewer than a quarter reported having a specific policy for teaching handwriting to left-handed pupils; only 13% said they gave left-handers specific handwriting instruction" (Lepkowska, 2006). As a result, I observed that the left-handed pupils at Ridge Primary School struggled with their daily handwriting task of repeatedly copying down two words into their handwriting books as they frequently held their pen at awkward angles and smudged their writing with their hand. One such pupil experienced such frustration at this that he rarely attempted the handwriting tasks due to a fear of failure. These difficulties then naturally translated into literacy lessons in which the left-handed pupils disliked prolonged writing tasks and adopted awkward writing postures. Clarke summarises that "all of these problems lead a general deterioration in the quality of hand-writing, physical discomfort and a lack of enjoyment and overall confidence" (1993, p.10).

It is felt that "simple adjustments which would make writing so much easier and less tiring for left-handers are seldom allowed and more rarely taught" (Clark, 1974, p. 31). Therefore, my research centred around some handwriting exercises which aimed to resolve these problems through basic instruction. Firstly, each left-handed pupil copied the alphabet into their handwriting books and I observed their strategies for doing so. Although the pupils naturally tilted their book to a slight angle in order to be able to see what they were writing, half of them curled their hand around their

pen so that they could meet the paper at the same angle as a right-hander and twisted their body to grip the pen. As a result, they were more prone to smudged work and frustration at their writing difficulties. Clark refers to this as the 'hook technique', explaining that "it is difficult to achieve neat writing by this technique and since it is also a continual strain on the hand anyone adopting it will readily become fatigued if required to do much writing" (1974, p. 33). One such pupil explained that; "I hate handwriting and I don't like literacy lessons. I'm really slow at doing my writing and I'm not very good at making it look neat, even when I try hard. And it really hurts my hand" (Joe). When questioned, about their pen positioning, one pupil said that "I can't really remember if we were told how to hold our pen properly" (Iain), with another pupil elaborating that "how everyone else holds their pens is different to us" (Felicity).

The left-handed pupil were then given a copy of the alphabet, taken from *Letter Formation for Kids* (2006), which included arrows to indicate the direction in which pupils should form each letter. I offered them guidance for completing the task by firstly ensuring that they adopted a comfortable posture and then encouraging them to turn their paper sideways to the left of their body when writing. I then demonstrated how they should hold their pencil, explaining that it should be held an inch or more from the point so that they could see the letters which they were forming and that their pencil should be pushed across the page rather than pulled. As they began their handwriting, I reminded them to place little pressure on the paper in order to prevent their hand from getting tired (Clarke, 1993). In adhering to these strategies and following the directional arrows, each pupil completed their alphabet neatly. Some of their results are shown in Appendix G. They were particularly responsive to the idea of positioning their paper at a sideways angle with one pupil explaining that "I could actually see all the letters that I had written which I can't normally do" (David). Thus, it was apparent that these simple steps had an immediate impact on the quality of pupil's handwriting and on their self-esteem.

Analysis and critical reflection of my research methodology

Whilst I feel that my research was fairly comprehensive in covering a diverse selection of thirty pupils aged between seven and eight, aspects of my research were made difficult due to the fact that each pupil was relatively young and therefore struggled at times with some of the concepts

presented to them. This was particularly problematic during the laterality test with tasks such as winking, resulting in the need for a greater level of guidance with regards to each activity that they performed. Whilst I have tried to make sure that all of my results are accurate, this may have resulted in some anomalies. Therefore, my research is likely to have been considerably easier with slightly older pupils. Nevertheless, I feel that my observations are more valuable and naturalistic with year three pupils because they are still developing strategies for being left-handed within the primary classroom.

I found my research into cutting out to be productive as it demonstrated that left-handed pupils would benefit from further guidance when using scissors and similar school equipment throughout their time at primary school. Simple exercises such as the ones that I performed with the pupils would provide the guidance that left-handed pupils need in order to enhance their self-esteem in relation to that of their right-handed peers. Indeed, a few days after my research took place, one of the pupils involved in the study said to me "Look! I've remembered to do my cutting out line you taught me and it's a lot neater than my cutting out from last week!" (Joe). Similarly, left-handed pupils seemed to benefit from the handwriting guidance which my research offered them. Informal observations of their handwriting throughout the rest of the school week revealed that each pupil had remembered to position their paper sideways and was attempting to hold their pencil in the position that I demonstrated to them. Therefore, I feel that it is essential that primary schools implement a left-handed policy in order to raise awareness amongst pupils and staff of difficulties that left-handers may face within the primary classroom and of strategies to assist with this. It would also resolve the fact that "there is no formal requirement that teacher training should cover how to teach left-handers, and the majority of teachers are supposed to recognise the difficulties and deal with them alone" (Julius, 1999). This would have significant implications in terms of increasing the confidence of left-handed pupils. My research has also found that crucial elements of this policy should address access to left-handed equipment and to handwriting instruction.

Implications for my own Professional Development

Overall, I feel that all of my research into the position of left-handed pupils in the primary classroom has been incredibly revealing in terms of demonstrating to me the lack of guidance and

support that left-handed pupils are currently receiving. Whilst it is again important to note that left-handed pupils are not at a substantial disadvantage in relation to their right-handed peers, it is evident that they would benefit from greater assistance throughout their formative years at primary school. My research has also found that it would not be particularly time consuming for teachers to provide basic strategies to left-handed pupils in order to aid them with their work.

In terms of my own professional development, I intend to continue to ascertain pupil's perspectives on being left-handed and the challenges that this may present within the primary classroom throughout my final school placement. In doing so, I will also observe the strategies that the school is currently implementing in order to prevent such difficulties. I then hope to incorporate the most successful of these strategies into my own classroom practice in order to ensure that pupils are not negatively affected by their handedness. This will initially involve identifying the left-handed pupils within the class and positioning them in a way which is most beneficial to them when developing my seating plans. Indeed, Clarke advises that teachers "take a moment to consider the general layout of your class and the positioning of the left-handers in relation to each other and the right-handers" (1993, p. 13). She explains that "left-handers will be more comfortable seated on the right side of the room as they face the front" (1993, p. 13) and that it may be advisable to seat left-handed pupils together so that they can support and help each other. Clarke also advises teachers to ensure that the classroom lighting doesn't cause shadows for pupils, which could cause difficulties when performing tasks such as handwriting (1993).

I will also endeavour to establish a left-handed policy within my own school in order to educate other teachers about the importance of being aware of left-handed pupils in the classroom and how they differ in terms of their techniques to learning. I feel that the implications for doing so would be relatively undisruptive for the school timetable as the policy would mainly consist of guidance and materials relating to handedness. It is important that the policy also covers strategies for handwriting which are taught at the start of the academic year and then consistently enforced by each teacher. This would be particularly valuable for younger pupils within each primary school. It would also serve to increase the enjoyment and achievement of left-handed pupils, thus corresponding to the government's 'Every Child Matters' policy (Boateng, Clarke and Hodge, 2003). Ultimately, the perspectives of left-handed pupils have been instrumental in enforcing the

lack of awareness of teachers towards handedness. Therefore, I intend to carry on my research within my own classroom and to develop resources that will benefit both left-handed pupils and right-handed pupils who exhibit signs of crossed-laterality.

References

Anything Left-Handed. (2009). Left-handed products and information. Retrieved on February 27, 2010, from http://www.anythingleft-handed.co.uk/

Bell, J. (1999). Doing Your Research Project: a guide for first-time researchers in education and social science. 3rd Edition. Buckingham, Open University Press.

Blakeslee, T. R. (1980). The Right Brain: A New Understanding of the Unconscious Mind and its Creative Powers. New York: Doubleday.

Boateng, P., Clarke, C., & Hodge, M. (2003). Every Child Matters. London: The Stationary Office [TSO].

Clark, M. (1974). Teaching Left-Handed Children. London, University of London Press Ltd.

Clarke, G. (1993). Left-Handed Children: The Teacher's Guide. The Left-Handed Club, London.

Francks C. et al. (2007). LRRTM1 on chromosome 2p12 is a maternally suppressed gene that is associated paternally with handedness and schizophrenia. Molecular Psychiatry, 12, 1120-1139.

Johnson, D, Nicholls, M, Shah, M and Shields, M. (2009). Nature's Experiment? Handedness and Early Childhood Development. Demography. 46 (2), 281-301.

Julius, C. (1999, 9 April). When right is wrong; Left-handedness. Times Educational Supplement.

Left-Handed Children. (2006). Information for left-handed children. Retrieved on February 26, 2010, from http://www.lefthandedchildren.org/

Left-Handed Letter Formation for Kids. (2006). Retrieved on February 6, 2010, from http://www.lefthandedchildren.org/letter-formation-lf.pdf

Left-Handed Scissors and Cutting for Kids. (2006). Retrieved on January 28, 2010, from http://www.lefthandedchildren.org/cutting-cg.pdf

Lepkowska, D. (2006, 13 January). Not Right. Times Educational Supplement.

McManus, C. (2002). Right Hand, Left Hand: The origins of asymmetry in brains, bodies, atoms and cultures. London, Weidenfeld and Nicolson Ltd.

Milsom, L. (2008). Your Left-handed Child. London, Octopus Publishing Group Ltd.

Pollard, A. (2005). Reflective Teaching. 2nd Edition. London, Continuum.

Appendix A

Laterality Test Questions

1 Fold your arms. Which forearm is uppermost?

2 Tilt your head to one shoulder. Which shoulder does it touch?

3 Someone in front of you is shouting but you cannot hear the words. Cup your ear to hear better. Which ear do you cup?

Imagine you are applauding. Start clapping your hands. Which hand is uppermost?

5 Count to three on your fingers, using the forefinger of the other hand. Which forefinger do you use?

6 Wink at an imaginary friend straight in front of you. Which eye does the winking?

7 Interlock your fingers. Which thumb is uppermost?

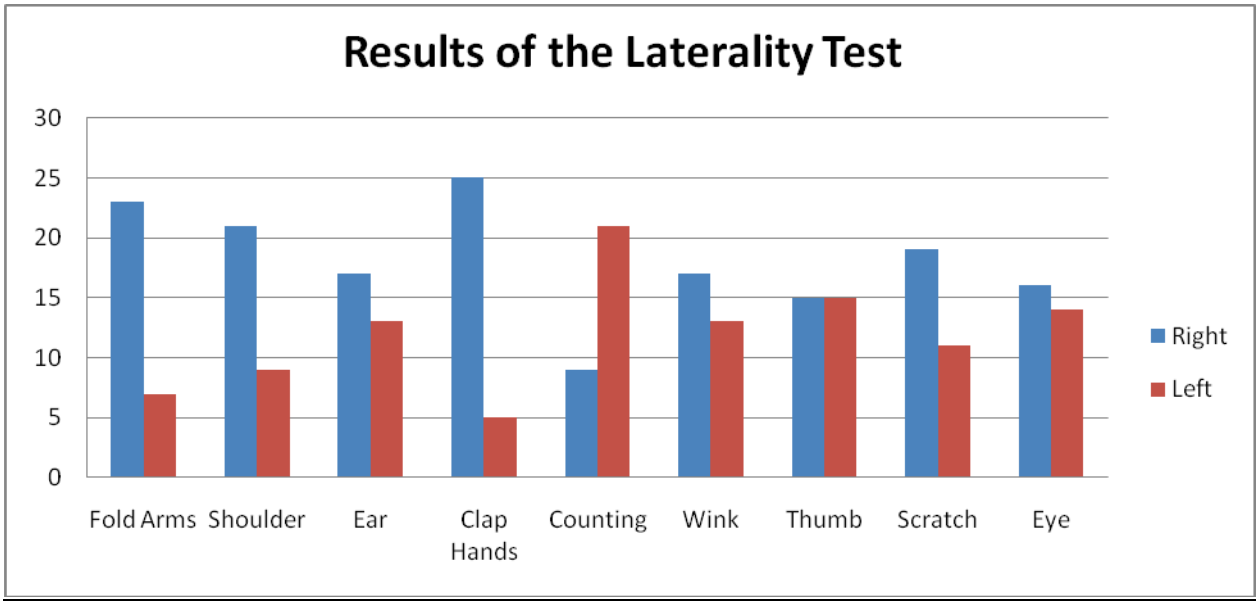
8 Imagine the centre of your back is itching. Which hand do you scratch it with?

9 Fixate a small distant object with your eyes and point directly at it with your forefinger. Now close one eye. Now change eyes. Which eye was open when the fingertip remained in line with the small object? (when the other eye, the non-dominant one, is open and the dominant eye is closed, the finger will appear to move to one side of the object.)

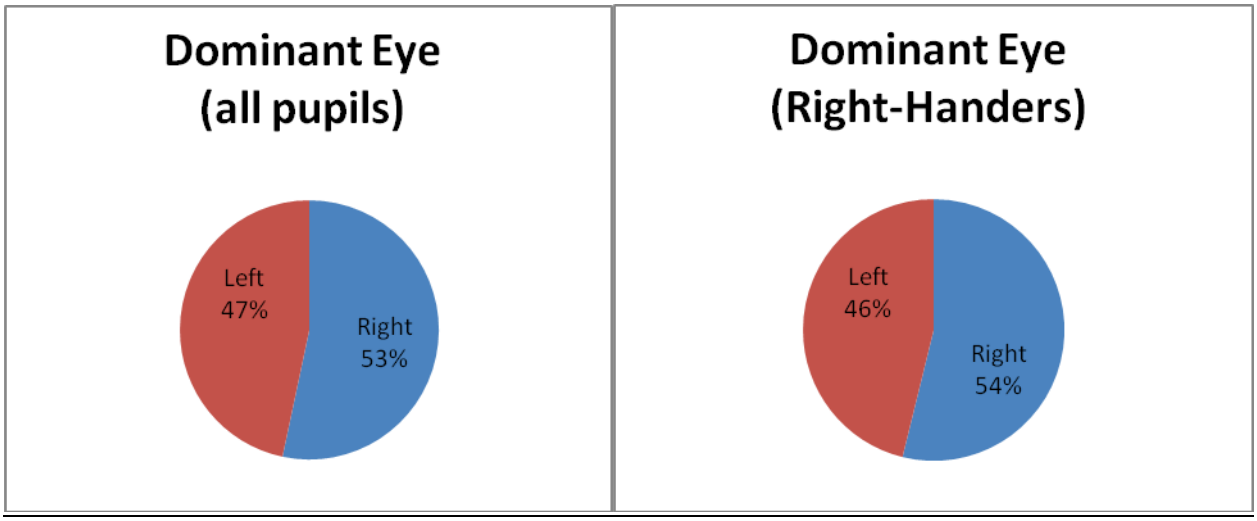
Appendix B

	Fold your Arms. Which forearm is upmost?	Tilt your head on one shoulder. Which does	Cup your ear. Which do you cup?	Clap your hands Which hand is uppermost?	Count to three using your forefingers.	Which eye do you wink at an imaginary friend with?	Interlock your fingers. Which thumb is uppermost?	Which hand do you scratch your back with?	Which eye is dominant?
Karl	R	R	R	R	L	R	R	R	R
Jamaal	R	R	R	R	L	R	R	R	R
Lisa	R	R	R	R	L	L	R	R	L
Helena	R	L	L	R	R	L	L	L	R
Hal	R	R	L	R	L	R	R	L	L
Joe	R	L	R	L	R	L	L	L	L
Alice	R	R	L	R	L	L	L	R	R
Simon	R	L	R	R	L	R	L	R	R
Lexie	R	L	R	R	L	R	R	L	L
Harriet	R	L	R	R	L	R	R	L	R
Trevor	R	R	R	L	L	R	R	L	R
Alicia	R	R	R	R	L	R	L	L	L
Sarah	R	R	R	R	L	L	R	R	L
Richard	R	L	R	R	L	L	R	L	R
Iain	R	L	L	L	L	R	L	R	R
Michael	R	R	R	L	R	L	L	R	R
Felicity	R	R	L	R	R	L	R	R	R
Giles	R	R	R	R	R	R	L	L	L

Appendix C

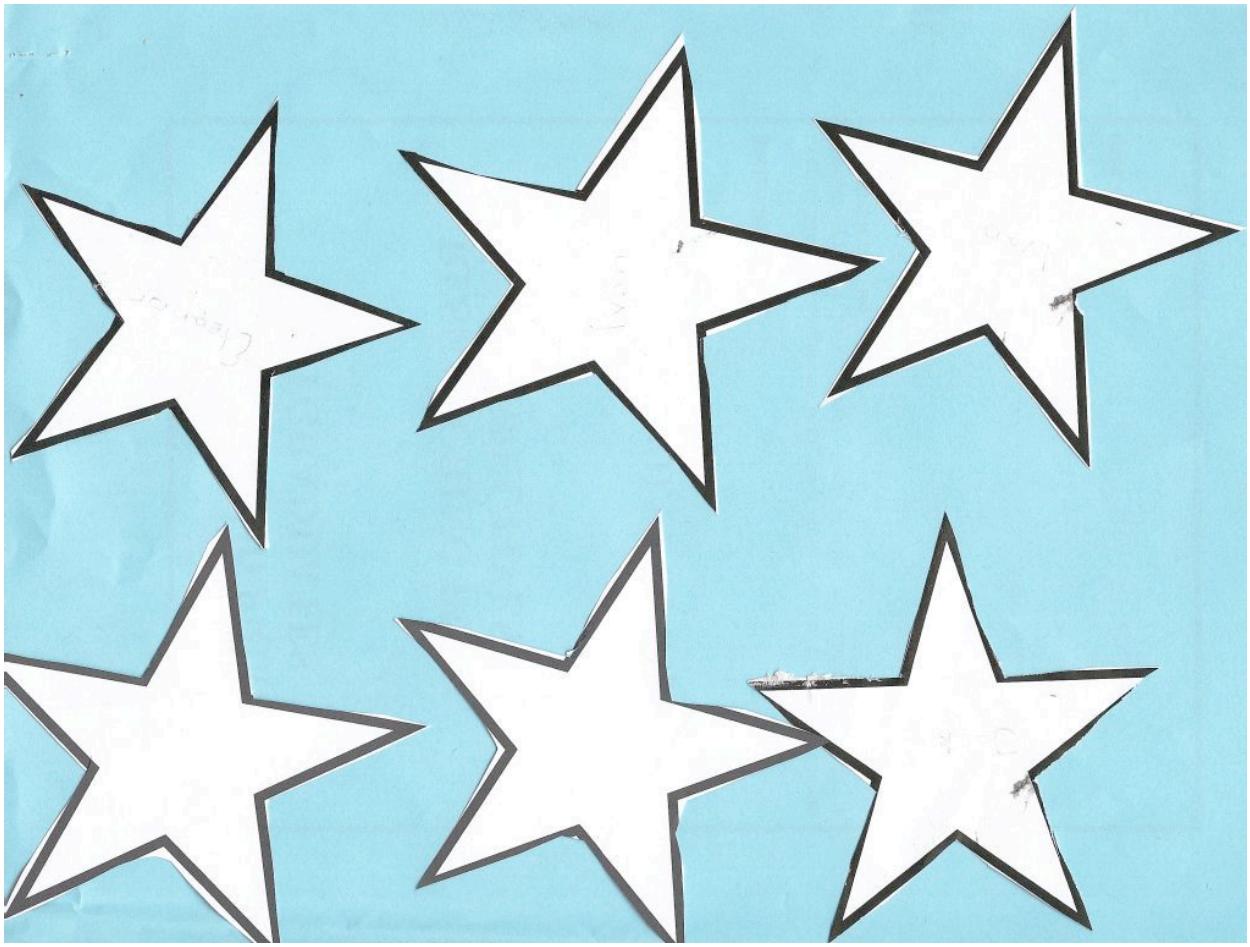


Appendix D



Appendix E

Appendix F



Appendix G