ANGLIA RUSKIN UNIVERSITY


THE IMPACT OF KINAESTHETIC TEACHING ON STORY WRITING


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ANGLIA RUSKIN UNIVERSITY ABSTRACT

FACULTY OF HEALTH AND EDUCATION

DOCTOR OF PHILOSOPHY

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This thesis examines the use of kinaesthetic methods on the story writing of primary age children. There have been many claims by learning theorists and the protagonists of learning theories, but these have not been tested. I test the claims of one learning theory, VAK, which are quickly rejected. One aspect of the theory however is investigated in depth, the kinaesthetic element. Kinaesthetic teaching offered the hope of increased attainment as well as more purposeful learning.

Mantle of the Expert was used in the context of Literacy. It was combined with Pupil Voice, metacognition and a range of other initiatives. These initiatives together created an environment in which the children, having been taught kinaesthetically, took on the role of experts. The children's perspectives were gained using interviews, questionnaires and field notes of their comments. The role of metacognition in learning was briefly investigated. The attainment of two classes (N=57) was then compared to the national average improvement in attainment of two parts of a level using the case study approach. Results were quantitatively analysed to establish the validity of the increased attainment using the kinaesthetic method.

The main findings were that learning styles are not consistently chosen by children of primary age. The findings also indicated that the children enjoyed learning kinaesthetically and that subsequently it helped them to write. The finding that kinaesthetic teaching improved attainment could not be supported.

The findings suggest that if teaching and learning was made more practical, the children would enjoy learning and significantly enhance their attainment. The research and notably the role of the children in the study, led to the synthesis of kinaesthetic memory and emotional contagion in an educational context.

Key words: kinaesthetic; Mantle of the Expert; metacognition; constructivism; Pupil Voice; emotional contagion; kinaesthetic memory.

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# ACRONYMS

ALPS        Accelerated Learning in Primary Schools

ANOVA     Analysis of Variance

ARG         Assessment Reform Group

Auditory    another term for audial

CATs         Cognitive Ability Tests

DES         Department of Education and Science

DfEE        Department for Education and Employment

DSCF       Department for Schools, Children and Families

IBM         International Business Machines

IQ           Intelligence Quotient

LEA         Local Education Authority

LDP         Laboratory Design Project

MI           Multiple Intelligences

MKO        More Knowledgeable other

MLE         Mediated Learning Experience

MoE         Mantle of the Expert

NLP         Neuro Linguistic Programming

NLS         National Literacy Strategy

NNS        National Numeracy Strategy

OECD       Organisation for Economic Co-operation   and Development

PGL         Peter Gordon Lawrence

PISA         Programme for International Student Assessment

SATs        Standardised Assessment Tests

SEN         Special Educational needs

SPSS        Statistical Package for the Social Sciences

TVEI  Technical and Vocational Educational Initiative

UK   United Kingdom

UNCRC  United Nations Convention on the Rights of the Child

VAK   Visual Auditory and Kinaesthetic

ZPD   Zone of Proximal Development

# GLOSSARY

**Cluster schools:** A group of schools in an area that have close links and which send children to a particular secondary school.

**Constructivism:** Constructivism is a theory of how people learn. People construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences.

**Emotional Contagion:** The phenomenon of having one person's emotions and related behaviours directly trigger similar emotions and behaviours in other people.

**Kinaesthetic memory:** Kinaesthetic memory, or muscle memory describes the process where a memory is formed through the repetition of an action.

**Local Education Authority:** local councils in England and Wales that are responsible for education within their jurisdiction**.**

**Mantle of the Expert:** An education approach that uses imaginary contexts to generate purposeful and engaging activities for learning.

**Metacognition:** The awareness and understanding of one's own thought processes.

**Motivation:** Motivation results from internal and external factors which stimulate people to become interested and committed.

**Pupil Voice:** Refers to the involvement of pupils in the decision making process in schools. Pupils have a voice and can give their opinion through bodies and groups such as the school council.

**School council:** A group of children that meet under supervision to help determine the policy and direction of the school.

**Warhammer:** Warhammer is a miniature figure war gaming system made by Games Workshop. The figures are used in a battle system that has a set of rules of movement and firing.

**Zone of Proximal Development:** the difference between what a learner can do without help and what he or she can do with help.

**CHAPTER 1**

**THE INTRODUCTION**

**1.1 Introduction**

This thesis is a fusion of ideas. I do not use all of the ideas of any one theorist, instead I take elements from the theories of one expert and join them to the ideas of another. To these, I add my ideas or those that have come out of the present study. It is a holistic study, in a theoretical sense I use some of the ideas of Vygotsky, Piaget and Dewey amongst others. I use the ideas of Heathcote in a more practical way, in particular, her theory of the Mantle of the Expert; I also refer to the work of Gardner and the Multiple Intelligences. The study also relates to older philosophical ideas, such as Descartes' thesis of the mind and body split, or the mind and body dualism in which he argued that the two are separable. He had two reasons for this thesis; the first was religious because it provided a rational basis for a hope of the soul's survival after death. The second was more scientific, for the complete absence of mentality from the nature of physical things was central to making way for Descartes' version of the new mechanistic physics.

This thesis narrates an attempt to address the increasingly didactic nature of education. Even in primary schools, the focus is on the 3Rs[1]: children sit quietly listening to teachers whilst they acquire numeracy and literacy skills. The emphasis on the 3Rs was noted by Ball in his paper, Education, justice and democracy.

> There is a renewed emphasis on the basics – times tables, punctuation and spelling, a new national School Games competition, the introduction of a National Reading Competition and foreign language learning from age seven (Ball, 2013: 19.

This renewed emphasis upon the 3Rs is concerned with raising attainment. The current curriculum changes are framed within 'greater expectations' and they aim to increase the benchmark for GCSEs at secondary school, in other words, they are about raising attainment and standards. The benchmark will increase

> raising of the GCSE benchmark target from 30% to 35% in 2011, to 40% for 2012-13 and to 50% for 2015 (Ball, 2013: 20).

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[1] The 3Rs is a term that means reading writing and arithmetic.

Ministers make no attempt to conceal the purpose of the changes proposed. The emphasis on what is commonly referred to as 'back to basics' and raising performance in the primary curriculum.

> More generally, all of this is driven by another level of comparison, rendered through the league tables of national educational performance constructed from international PISA[2] testing (Ball, 2013: 20).

This national table is mirrored by another preoccupation of government ministers, that of the international table of the performance of children in schools in each of those countries.  The table is produced by the Organisation for Economic Co-operation and Development (OECD) as shown in Appendix 11. In an attempt to improve the performance of English and Welsh schools, the National Curriculum was changed in 2015 so that it is more in line with those of the best performing countries such as Singapore and China. The National Curriculum is now a Mastery curriculum, in which children need to explain what they have learned and solve a range of problems in different contexts. Another change was the replacement of levels mentioned in this work by bands. Instead of achieving a level, children fail to reach the band, achieve the band or exceed the band. The new focus is upon challenge, with children being challenged according to their ability. There has also been a return to the past in some aspects of the changes to the curriculum of 2015, amongst these are a return of obscure grammatical concepts such as generalisers and modal verbs, an emphasis on spelling and a return to the mathematical methods of the 1950s including long multiplication. Theresa May called for a return of grammar schools as a method of social movement for the working class, raising fears of more middle class children attending grammar schools.

I am a teacher who is interested in making school more fun and in improving standards and attainment. I joined a school led by a head teacher who had the desire to implement the latest educational ideas and he was eager to encourage research at all levels up to Ph.D. I had used kinaesthetic methods for many years and had noticed that children were enthused and more eager to learn when work was presented to them in a more

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[2] PISA is an acronym for Programme for International Student Assessment used for international comparisons of schools.

practical 'hands on' way. I developed an interest in Visual, Auditory and Kinaesthetic learning (VAK)[3], multiple intelligence and kinaesthetic teaching, in particular. A number of questions began to intrigue me which were:

- Do children keep the same learning style?

- Do children learn more quickly using kinaesthetic teaching?

- Do kinaesthetic learners[4] learn more than others using kinaesthetic teaching methods?

In 2008 when I began thinking about this research, learning styles and especially VAK were in vogue, and they were becoming widely used in school. No one at that time questioned where the theory of VAK had come from, and few teachers within the study school cluster group had read about the theory first hand. Many teachers were using VAK questionnaires to 'test' the children who were then often labelled as a certain type of learner. Like many of my colleagues, the one question I did not ask, was highlighted by Sharp and his colleagues:

> What perplexed us from the outset, however, was that no one we spoke to seemed to have any idea about where the VAK (visual, auditory and kinaesthetic) they were familiar with actually came from. (Sharp *et al.*, 2008: 89)

VAK was so popular in schools in 2009 that I decided to study some aspect of the theory in the school in which I work. The next step for me was to decide on the narrow study subject. I decided to focus on story writing as the subject of this study. I chose writing for the study because the study school had noticed for several years that the results in the Standard Assessment Tests (SATs), were not as good in writing as they were in other areas. The results for maths, reading and science were, however, well above the national average. I hoped that through this study, I might find a reason for the relatively poor performance of the school in story writing.

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[3] VAK is an acronym that stands for Visual, Auditory and Kinaesthetic, which became a learning theory.
[4] Kinaesthetic learners in this study is a reference to claims made by the children themselves, and proved to be an unreliable label.

My university tutors and I decided that the best course of action was to begin with data collection and to follow this with analysis. I collected the results for two years. I measured the degree of improvement over the course of one academic year. The children were assessed at the start of the year and again at the end. I collected the first data in 2010 and the second in 2011. I devised the kinaesthetic writing activities outlined in appendices five, six, seven and eight.

Story writing was to be taught just three times before the SATs in May, they were in September, January and March. The first activity carried out in September was the Warhammer game. The second activity in January was the spy activity, and the third was the murder mystery. Each of the activities lasted for approximately two weeks. In the case of the Warhammer game, the first week was spent making the characters and the game board. We also did extensive word activities to generate a bank of words that could be used in the writing activity that would come later.

I hoped that through this work, at least some of the questions raised on page two would be answered. This research set out to explore the impact of one learning theory, but in the process of conducting the research a new methodology developed. The research draws upon both qualitative and quantitative sources of information.

## 1.2 Positioning the Research: The Research Questions

The thesis is not a conceptual or theory-led piece of research: it borrows from several methodologies. When I began, I did not have a theory; I had a vague idea (or prejudice) that when teaching children kinaesthetically[5], kinaesthetic learners would benefit more than children with other types of learning styles:

> 'Kinaesthetic learners prefer to learn by doing. They are good at recalling events and associate feelings or physical experiences with memory (Pritchard, 2009: 46).

I believed however that pupils with other learning styles would also benefit from being taught kinaesthetically, otherwise had I not, the research would have been unethical.

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[5] Kinaesthetic teaching refers to educational activities which require children to move, act, perform, or to be engaged through mantle of the expert.

When I began, I believed that if properly planned, well-constructed and well organised, kinaesthetic activities would benefit all of the children. Kinaesthetic activities could I believed, improve attainment more than using other methods such as didactic methods where the teacher delivers lessons from the front of the class. In conducting this research, my belief was that all children would benefit, but that some might benefit disproportionately.

I also believed that children and adults had one learning style and that this learning style did not change through life. For example, if I learned visually, I learned visually for life. If I were a kinaesthetic learner, in other words if I learned by doing, then I would learn by doing for the rest of my life. That supposition, as well as others, would go on to be challenged by the activities and findings of this research. This work addresses several gaps in research in terms of the claims of learning theories. VAK had not been tested nor fully evaluated; this research attempts to evaluate some of the claims of VAK proponents. One of those claims is that children are one type of learner, they are either visual, kinaesthetic or an auditory learner. In order to test the claims of VAK, kinaesthetic teaching was used exclusively in one area of teaching (story writing), then tested to see if it increased student's performance (attainment). Another aspect that I tested was whether all children gained equally or whether some children progressed more than others when taught kinaesthetically.

Initially, I was unsure of the aspect of VAK that I should focus on. I began to read about the subject as well as other learning theories. I began to narrow the area of focus to a number of issues that I identified, then I narrowed the issues to a series of questions, and then chose the final questions.

The research questions are:

**RQ1- Are learning styles consistently chosen by individuals?**

**RQ2- Can kinaesthetic teaching improve children's attainment?**

**RQ3- Can the benefits of kinaesthetic learning be attributed differently according to children's learning styles?**

**RQ4- What is the children's perspective on the kinaesthetic teaching and learning methods?**

**RQ5- What is the role of the metacognitive process in children's learning?**

As I mentioned above in the introduction, there have been calls for a return to the three Rs (as stated above), and the 'traditional curriculum' including a former Secretary of State for Education, Michael Gove.

> Michael Gove may raise primary targets after new figures showed his exacting approach to standards had succeeded in more than halving the number of schools failing to give pupils a good grounding in the three Rs. (Garner, 2012)

Play is seen as an extracurricular reward or as something outside of real work that children are required to do. Furthermore, much of the literature which relates to playing in the classroom in schools, is written about kindergarten or infant children. The dearth of writing about junior children and play seems to imply that play is beneficial to adults and very young children, but not for those of junior age (seven to eleven).

Education is vital to every child's future; the early years provide the academic foundations that shape later life. Early experiences of school can also determine attitudes towards education that can affect future careers and the ability to socialise with peers. It is essential that pupils enjoy their education and develop the ability to know how to answer questions, problem solve and locate information amongst many other skills:

> Education has played and is still playing an important role in forming and training the individual throughout his existence. (Pargaru *et al.*, 2009: 647)

The role of the teacher is, therefore, an essential one not only in terms of the life of the individual but also in terms of the needs of society.

### 1.3 Introducing me and how my interest in this topic developed

Having always had an interest in education, I first taught in Zimbabwe, following the country's independence in the early 1980s. I taught Geography and Science to local people who had been denied the opportunity to gain an education. Although English was the second language in Zimbabwe, they learned science in English, as well as all of the other subjects. The pupils then sat examinations in English, which was their second language.

When I returned to Britain, I briefly taught in a public school then following a period away from the classroom; I trained as a Secondary Science teacher. After teacher training, I worked in West London for just over two years at a time when the National Curriculum was being introduced. The introduction of the National Curriculum and the requirements of the science curriculum provided opportunities for Secondary Science teachers to teach in primary schools. I moved to the London Borough of Newham to teach in a primary school in the late 1980s, where I stayed for nine years. Since then I have taught in a number of schools in Essex.

At present, I am teaching in a school in Essex, which is a two-form entry school with a nursery and reception and around 420 children. The school is similar to the cluster schools located in the same area. The study school is one of eight primary schools within the town, these schools make up a cluster group. It has the highest overall added value[6] of all of the schools, at 100.6. The lowest of all of the cluster schools however, is 99.2, which is not that different from the study school. The study school was only 3rd out of 8 for the number of children that achieved level 4 or above in maths and literacy and 3rd for the number of high achieving pupils. Though the value added was of a similar range, the greatest variation was found in the percentage of pupils that achieved level 4 or above. The highest was 95%, the study school 92% but the lowest was below the national average at 75%. There was also a difference in the numbers of high achieving students, the lowest was 22%, the highest 46% with the study school achieving 41%.

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[6] The added value refers to the amount of improvement a child makes over the six years that they are in the school.

I have taught for just over thirty years in the classroom apart from a brief period as a deputy. The study school is in what would be classified as a middle-class area with few children having free school meals, and there is little social deprivation. Parental attitudes toward school are good as are those of the children, education is important and there is the desire to achieve within the community.

The study school has above average attainment for its pupils (typically 88-92% level 4 and 30-67% level 5) in the areas of the curriculum that are tested. The national average is 78% level 4 at the end of key stage two (eleven years of age) and 15-20% at level 5. The challenge for the study school has been to how extend the pupils still further, to help them achieve even more than they do at present. The school aspires to include the thinking skills in all key areas of the curriculum in order to help pupils perform better still. A thinking skills scheme was developed which incorporates a range of skills including lateral thinking, mnemonics and memory recall.

The head teacher became interested in thinking skills several years ago and took an interest in the latest educational ideas when he studied for an MA in education. He introduced the ideas of Mantle of the Expert, Pupil Voice, school council, visual, auditory, kinaesthetic learning (VAK).

Despite the inclusion of thinking skills in some detail in the National Curriculum, learning styles was almost completely ignored. Little mention was made of learning styles, despite the work of Gardner's (1993) Multiple Intelligences amongst other similar works. There was a brief mention of learning styles, under the section about inclusion, where there was a subsection about motivation and concentration on page 32:

> Teachers secure pupils' motivation and concentration by: using teaching approaches appropriate to different learning styles. (National Curriculum, 1999: 32)

There was also a second mention of learning styles on the next page.
The mention of learning styles was under 'using appropriate assessment approaches'.

Teachers use appropriate assessment approaches that:

> allow for different learning styles and ensure that pupils are given the chance and encouragement to demonstrate their competence and attainment through appropriate means. (National Curriculum: 1999: 33)

The staff in the study school decided that thinking skills should be included in lesson plans throughout the curriculum. The teachers took the decision despite the lack of detail about learning styles in the National Curriculum. A modular curriculum was developed and taught at the school, wherever possible modules begin with a philosophical starter to encourage pupils to think about the issues involved in a certain area of the curriculum. Following from the brief mention of thinking skills in the National Curriculum, I will now briefly review the history of the subject.

### 1.4 A brief history of learning theories

The earliest recorded interest in learning occurred in ancient Greece and can be seen in works such as the essay by Aristotle called 'Memory,' which explored the link between entities such as lightning and thunder. Modern interest in the psychology of learning dates back to the late nineteenth century. William James, who was an American philosopher and physician amongst other things, is thought by many to have been at the beginning of the study of mental processes. James said that psychology was the 'science of mental life' (Pritchard 2009: 3).

The early study of learning, focused on behaviour and the work of Pavlov (1902) had an important influence on the early research. John B. Watson is often credited with the founding of the behaviourist movement. Watson described psychology as 'a purely objective experimental branch of natural science' with a 'theoretical goal' of 'prediction and control of behaviour' (Watson, 1928: 158) he then defined behaviourism in more detail as:

> Behaviorism is the scientific study of human behavior. Its real goal is to provide the basis for prediction and control of human beings: Given the

situation, to tell what the human being will do; given the man in action, to be able to say why he is reacting in that way. (Watson, 1928: 2)

He published what was considered to be the first definitive book on behaviourism, 'Psychology as the Behaviourist Views it.' It was an important book for a number of reasons, but especially because, for the first time, behaviourism was given a definitive set of goals, methods and parameters:

> The structure that Watson illustrated for behaviourism was a discipline based heavily on rationalist thought, and on the idea that learning is a major influence on development and behaviour. (Rilling, 2000: 306)

At the same time, Watson abandoned his study of philosophy, he abandoned philosophical terms and concepts, in favour of language that reflected the pragmatism of behaviourism:

> Watson's behaviourism sought to sever any last remnants of the relations of psychology to mentalism and philosophical concerns. Philosophical terminology was abandoned. Philosophical problems and traditional subjects of study like consciousness yielded place to animal researches and studies of learning, conditioning and the like. (Sexton, 1978: 8)

Behaviourism viewed learning as a straightforward process of response to stimuli, a reward or reinforcement was offered, which was believed to strengthen the response and therefore, result in a change in behaviour. The test, according to this school of thought was whether learning had occurred and whether this could be seen in a change in behaviour:

> The behaviourist perspective associated with B. F. Skinner, holds that the mind at work cannot be observed, tested, or understood; thus, behaviourists are concerned with actions (behaviour) as the sites of knowing, teaching and learning. (Spillane, 2002: 380)

One of the keys to effective teaching in the classroom is discovering the best consequences to shape the behaviour, consequences can be positive or negative, punishing or rewarding. Behaviourism attempted to become a fully mechanistic, objective science, in so doing it ignored certain aspects of human behaviour, such as

emotions. Although behaviourism still has some influence in education and even more in psychology, behaviourism as a theory began to lose support until it was almost discredited. Because behaviourism did not fully explain learning, Constructivism developed and began to gain support.

Constructivism was a synthesis of several different theories combined into one; it was the assimilation of both behaviour and cognitive ideas:

> The constructivist stance maintains that learning is a process of constructing meaning; it is how people make sense of their experience. (Merriam and Caffarella, 1999: 260)

Constructivists believe that the individual takes in information from the environment about a problem and both learn and construct meaning for himself/herself. Constructivists view knowledge as the result of individual constructions of reality within the mind of the learner. They believe that learning occurs through the creation of rules and hypotheses to explain what is observed:

> The need to create new rules and formulate new hypotheses occurs when the student's present conception of reality are thrown out of balance by disparities between those conceptions and new observations. (Brooks, 1990: 68)

When learning, therefore, the individual takes in information to himself or herself and joins it to what he or she already knows.

There have been several very important contributions to the philosophy of education by constructivist theorists. Amongst the most famous and influential of these are Montessori (1936), Dewey (1933), Vygotsky (1935) and Piaget (1937). Unfortunately, I can only mention their work briefly, due to the limitations of space. Piaget and Vygotsky believed that learners construct their knowledge and understanding. Vygotsky argued that social interaction played a fundamental role in the development of cognition. According to Vygotsky, culture made two kinds of contributions to children's intellectual development. Firstly, children acquire much of the context of their thinking (cognition) from their culture. Secondly, they acquire the processes or means of their

thinking, in other words, the culture of a child teaches them both what to think and even how to think:

> Human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them. (Vygotsky, 1978: 88)

Learning is dependent on social interaction because children copy the observed behaviour of their parents:

> Vygotsky stressed the importance of social interaction in which the individual was to be found; Piaget stressed the inner motivation to balance new information with existing knowledge and understanding. (Pritchard, 2009: 117)

An important aspect of the social nature of learning that was introduced by Vygotsky was the role of the More Knowledgeable Other (MKO). The MKO could be an adult, teacher or it could be a peer, a friend in the class. Vygotsky believed that social learning comes before development:

> Learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological function. (Vygotsky, 1978: 90)

Piaget believed that children learnt through being active. Vygotsky, however, believed that learning was a socially mediated activity, as opposed to the 'lone scientist' of Piaget, who argued that the learner acquired knowledge and skills independently:

> Human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them. (Vygotsky, 1978: 88)

Vygotsky's argument was supported by Freire, who stated that:

> Knowing is a social process whose individual dimension, however, cannot be forgotten or even devalued. The process of knowing, which involves the whole conscious self, feelings, emotions, memory affects an epistemologically curious mind. (Freire, 1998: 92)

Piaget analysed the processes of thinking and learning through the focus on the 'mental and cognitive processes that make them possible'(Piaget, 1936); he believed that children shape the way that they see reality through a continuous interaction with the environment around them. Piaget argued that knowledge growth was something that happened continually in a sequential process consisting of logically embedded structures (schemata) following one another throughout an individual's lifetime. He divided his schemata into four stages of development. Children move from one stage to the next by maturation and exploration. The four stages[7] identified by Piaget (1936) were:

- The Sensory Motor Stage,

- Pre-operational stage,

- The concrete operational stage and

-  The formal operational stage. A more in-depth outline of the four stages can be found in appendix four.

Feuerstein developed the theory of Mediated Learning Experience (MLE), which he argued was more than a simple pedagogical model and argued that it entailed the shaping of cognitive processes as a by-product of cultural transmissions. Feuerstein emphasized the role of cultural transmission through MLE as: 1) fundamental to the preservation of identity at the individual and group levels and 2) fostering the cognitive, affective, and emotional investment toward the future (Feuerstein, 1990: 92-93).

The theory was developed by Feuerstein because at the end of World War Two, a large number of young people arrived in Israel from Europe and North Africa. Many of them had suffered traumatically in their early lives and had not had a home life that had provided them with consistent family or cultural influences. Many of them scored so badly on the Intelligence Quotient (IQ) tests that they appeared to be in-educable. Feuerstein believed that rather than accept the fixed nature of intelligence as a

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[7] Piaget first published the four stages of Cognitive development in1936.

commodity that could not be altered, he viewed intelligence as a 'malleable thing', and this belief is supported by this thesis:

> What if, instead of measuring a child's acquired intellectual skill, the ability to learn was evaluated first? And what if intelligence was not a fixed attribute, measurable once and for all? What if intelligence can be taught and was in fact the ability to learn? (Feuerstein, 2002: 10)

Rather than accepting the predicament and closing the door on any solution, Feuerstein tried to integrate young immigrants. He devised ways of finding out which cognitive functions they were deficient in, how they could be helped to develop these and what each one's potential for learning was.

Some educational theories have focussed on knowledge, not upon the individual learner. Post-modernist theories for example, adhere to the world view that what is real is what is observed, believed or experienced:

> The self in postmodern thought is not the unified, integrated, authentic self of modern times. Rather, the self is multiple, ever changing, and some say fragmented. (Merriam and Caffarella, 1999: 357)

Postmodern thinking has evolved, some individuals now consider a new identification, instead of seeing life as ordered by societal norms, it is now viewed as being in a state of constant change, as societal norms shift. This has caused schools and the education system to change teaching toward a less traditional form.

Postmodernism viewed knowledge as a cultural construct; it argued that objective knowledge was not possible.

> Common sense knowledge rather than ideas must be the central focus for the sociology of knowledge. It is precisely this knowledge that constitutes the fabric of meaning without which no society could exist. The sociology of knowledge, therefore, must concern itself with the social construct of reality (Berger and Luckmann, 1966:27)

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Knowledge is made in a particular culture, and different cultures view the world in different ways. Postmodernists would reject an idealised view of truth. To Postmodernists, truth is not inherited from the ancients rather the idea of truth is replaced with a dynamic truth that changes. Truth is bounded by time, space and perspective.

> Postmodernists, tend to reject the idealized view of truth inherited from the ancients and replace it with a dynamic, changing truth bounded by time, space, and perspective. (Wilson, 1994)

Another influential theory and the one that gave rise to VAK, the subject of this study, was Multiple Intelligences developed by Howard Gardner[8] in the 1980s and 1990s. Gardner argued that there was not one type of intelligence, as had been believed for many years. The old idea had been that there was one type of intelligence and that this could be measured using IQ[9] tests. Gardner's theory was a reaction to the IQ test, his theory is a reaction against the idea that 'we had a one dimension of mental ability along which we could array everyone' (Gardner, 1993:3). Gardner argued that there were seven (later eight) types of intelligence (Gardner, 1999: 8-18):

1. Linguistic intelligence
2. Logical-mathematical intelligence
3. Spatial intelligence (the ability to form a mental model of the spatial world)
4. Musical intelligence
5. Bodily-kinaesthetic intelligence (the ability to solve problems using one's body as performed by athletes, dancers and other craftspeople)
6. Inter-personal intelligence (the ability to understand other people)
7. Intra-personal intelligence (the ability to understand oneself).

Gardner argued that it was only the first two types of intelligence that were under normal circumstances tested and measured by traditional IQ tests. The eighth intelligence (that was added later) was naturalist intelligence. The eighth intelligence was defined as 'expertise in the recognition and classification of the numerous species,

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[8] Howard Gardner developed the theory of Multiple Intelligences (MI), the theory proposed that there are several different types of intelligence, not just one.
[9] IQ tests are Intelligence Quotient test

the flora and fauna of his or her environment' (Gardner, 1999: 23). Gardner argued that everyone had all of these intelligences, but that:

> the amount might vary from individual to individual, but the intelligence is there nonetheless, all of us have the full range of intelligences; that is what makes us human beings, cognitively speaking. (Gardner, 1999: 23)

These intelligences are not given equal weighting in the West. Gardner argued that we in the West suffer from three biases, 'Westist, Bestist and Testist'; in other words, Western knowledge is considered superior, as is intelligence that can be tested. Gardner argued that other forms of knowledge and intelligence should be afforded equal merit. 'Logical thinking, for example, is important; rationality is important; but they are not the only virtues (Gardner, 1999, 23). In Chapter three we shall however see that Gardner's work has been highly criticised.

Other theories emphasised the role that experience plays in the learning process, an example of such a theory is that of Experiential Learning. Cognitive learning theories emphasise cognition as being more important than effect and behavioural learning theories deny any role for subjective experience in the learning process. David Kolb published his work, Theory of Experiential Learning (1984), which was amongst the first to determine that learning styles were closely linked to cognitive skills. According to Kolb, the impetus for the development of new concepts was provided by new experiences. 'Learning is the process whereby knowledge is created through the transformation of experience' (Kolb, 1984). Kolb argued that different people naturally preferred a single learning style; this would be determined by the social environment, educational experiences, or the cognitive structure of the individual.

From this brief selective account of the history of learning theories, it can be seen that learning has been studied extensively. Most research has been carried out in the last hundred years, and most theories have been developed in the same time frame. Learning theories are important to education and the correspondence between philosophical perspectives, and some theories of learning is quite apparent. In the traditional classroom, for example, activities revolve around the teacher, who teaches in a largely didactic style. Students are expected to study information in the classroom as well as for

homework until it is learned. Knowledge, as opposed to skills, takes the main stage, and it is seen as a transferrable commodity. Amongst others, Socrates rejected 'the pursuit of knowledge' for its own sake as a delusion and a snare. Socrates believed in two forms of knowledge, one ordinary, the other higher, (Brickhouse & Smith, 1994:181). Socrates believed however that higher knowledge was unattainable and a snare because it draws the student away from the study of conduct. He saw knowledge as definitional. He believed that the pursuit of definitional knowledge was a priority and precursor to philosophical discussion. (Brickhouse & Smith, 2000:118)  Other researchers agreed with this stance:

> Teaching cannot be a process of transference of knowledge from the one teaching to the learner. This is the mechanical transference from which results machine like memorisation. (Freire, 1998: 22)

In other words, the pursuit of knowledge for its own sake should not be the main purpose of education. Different classrooms emerge from different philosophical ideas. Educators who believe that knowledge is 'out there' waiting to be discovered would organise a classroom centred around the teacher (the source of knowledge). Educators who believe that students create knowledge afresh and that knowledge can be sought best through social activities would centre the classroom around the children. The second type of classroom would be likely to engage children in groups working on projects or discussing how best to solve a problem or negotiate the meaning of a concept. They are likely to help each other to learn, in so doing, they are more likely to acquire the skills of Mantle of the Expert. As the Chinese Confucian philosopher Xunzi (312-230 BC) said:

> Not having heard something is not as good as having heard it; having heard it is not as good as having seen it; having seen it is not as good as knowing it; knowing it is not as good as putting it into practice. (Knoblock, 1994)

I will now look at following chapters, and in particular at the contribution that each chapter will make to the thesis.

## 1.5 An outline of the thesis

There are three strands to this work; the first is the social strand, aspects of which will be discussed with reference to the work of Vygotsky and others and further developed in chapter seven. The second strand of this work, consists of the cognitive processes involved in learning. Cognitive processes will be discussed further in chapter two in the section about metacognition and again in chapter seven. The third strand of this thesis is that of kinaesthetic teaching and learning, which will be developed throughout this work but predominantly in chapters two and again in chapter seven.

In chapter two, the literature review I will discuss the initiatives and strategies used in schools that impacted upon this work. My teaching style and the way I organised the class and interacted with the children were to some extent dictated by the demands of the research method. I hope to show how the research would have been very difficult if not impossible had the class not been organised in a more 'egalitarian' way. The need for a more egalitarian organisation was also demanded by strategies used in the present study such as Pupil Voice and Mantle of the Expert.

Chapter two is subdivided into three sections, the framework, the processes and the pedagogic practices. The framework is the overall philosophy used which includes constructivism, playful learning and Pupil Voice. Constructivism is a theory attributed to Piaget (1936) and Dewey (1933) amongst others. Several aspects of constructivism are explored including where the emphasis lies in a constructivist classroom, whether this is on the understanding of the child or the learning of facts. Discussion includes constructivism in the classroom and the structures that need to be in place. I will also look at the discussion of constructivism and the divisions, the section will end with a discussion of social constructivism. Playful learning involves discussion of why we play, the benefits of play and how play was used in this research. The last section of the framework refers to a government initiative called Pupil Voice that calls for the greater involvement of children in their learning. The concept of 'Pupil Voice' has provoked a lot of attention in the past decade, a development which is often attributed to the

ratification of the United Nations Convention on the Rights of the Child (UNCRC), the relevant section is Article 12 (Noyes, 2005:533).

The processes follow discussion of the framework. Processes were the strategies used to carry out the philosophy of the framework; they involve motivation, metacognition and the imagination. It was important to the research that the children were motivated, but also motivation was important to their learning. The discussion will centre on the work of Carol Dweck and the notions of fixed or malleable intelligence. How the individual views intelligence leads to two very different mind sets that in turn can produce very different ways of viewing the world and different outlooks in terms of pupil motivation. Pupils with a fixed intelligence view believe that they are born with a given amount of intelligence (the entity theory of intelligence). People working with the entity theory of intelligence believe that being, above average intelligence, they are more 'gifted' than others:

> So we identified two different "theories" that students can have about their intelligence- a fixed, entity, theory and a malleable, incremental, theory. In the entity theory, intelligence is a fixed, concrete, internal entity, whereas in the incremental theory, intelligence is a more dynamic quality that can be increased. (Dweck, 1999: 20)

The main problem with the fixed intelligence view is that each and every test undertaken by them can either validate their intelligence and therefore, their view of themselves or it can invalidate both. In contrast to this view, is the incremental theory of intelligence, in which the believer feels that intelligence can be increased through hard work and effort. These views of intelligence lead to very different outlooks and a tendency to choose different goals as discussed in chapter two.

Chapter two goes on to discuss metacognition, I begin by defining what it is, and then I will link metacognition to intelligence and begin to develop an awareness of how metacognition was important to this research. The more metacognitive a child or person is, the greater is their ability to learn and acquire new knowledge because they understand how to learn and how to link new concepts to what they already know. I will then discuss the imagination and its role in this work. The children were required to use

their imaginations in the activities because they were role playing a character role such as a detective, a general or a spy.

The third section of the chapter looks at pedagogic practices, in particular, Mantle of the Expert. Although Mantle of the  Expert was developed by Dorothy Heathcote as a drama initiative, in this study the technique was extended to literacy and in particular to story writing. This idea was further developed through the use of props in the roles taken on by the children. Mantle of the Expert is the basis for much of the work in this study.

Chapter three explores the issues that impact this work, the impact of compulsory schooling will be discussed. There has been a debate about the efficacy of compulsory education since the concept was first devised. Chapter three will include a discussion of testing, in particular, the problems of testing. Chapter three will also include a more detailed discussion of the work of Gardner and VAK and in particular, some of the criticisms of these theories. Gardner has been criticised for his choice of intelligences, and especially, why some areas of human knowledge were defined as intelligences, while others were not. I will present the results to the first research question here because it supports the argument against VAK.

This work is an example of a case study, and chapter four, Investigating learning, looks at the methodology used and evaluates the advantages and problems of doing a case study. Discussion will include the use of quantitative and qualitative results. It will explain how quantitative, and qualitative results were used to triangulate observations and results with questionnaires and interviews with selected children. I did not start out this research with a theory that was then tested; theory emerged from the data and other evidence.

In chapter four, I discuss how I collected the data, then I move on to a discussion of how the questions were arrived at in the design of questionnaires. I explain the choice of open-ended questions and discuss the interviews used. As with all research, there were problems encountered throughout the work, not least the unintentional influence of myself, the researcher upon the results and research, in general. I briefly explore the

notion of the 'truth' and in particular whether when conducting research we are truly discovering an objective truth. Ethical considerations then form the last part of the discussion.

The findings and results are presented in chapter five, Evidencing the learning. The findings include the progress made by children over the course of a year. The findings include  the level achieved in July. This is then compared to the baseline teacher assessment that I made in September (at the start of the academic year). The overall class progress is measured, as well as groups of children, especially ability groups. Progress is also compared to the claimed learning style of the children. The results also compare the progress of those who claimed a kinaesthetic learning style to those who claimed an auditory or visual learning style.

In chapter five, I also present the responses to the questionnaires and interviews. The answers to the questions on the questionnaires are presented as a percentage of respondents who answered in a particular way. Responses along with the interviews that were then triangulated to develop the idea of a novel teaching approach are presented in chapter six, understanding the learning.

Chapter six presents a discussion of what the findings mean. In this chapter, I explore a new fusion of two concepts. I argue that learning is improved through the first concept which is emotional contagion. The second concept is kinaesthetic memory; my awareness of this concept developed from the responses of the children in answer to the questionnaires and interviews that were undertaken as part of the research. Chapter six concludes with a brief discussion of the fusion of the two concepts.

Chapter seven discusses the findings in relation to the three strands, social, cognitive and kinaesthetic. It also involves a greater discussion of the fusion of the two concepts mentioned above, Kinaesthetic memory and emotional contagion. It is one of these concepts, kinaesthetic memory that I argue questions the nature of Descartes' mind and body dualism because it requires the unity of mind and body.

The conclusions and recommendations in chapter eight relate the findings of the research to the original questions posed in this thesis. I will argue that the questions have to some degree been answered through the research, but that further research is needed to confirm the findings. In the conclusions, I will summarise how the research changed as it progressed. I suggest that the various elements (discussed in chapter two), e.g., Mantle of the Expert, combine with the kinaesthetic methods used in this research to form a different approach to teaching practice. The recommendations include future research that should be undertaken.

## 1.6 A change of direction

In chapter three, I discuss VAK in more detail, and outline the reasons for its rejection. I had set out with the belief that VAK was the way in which children learned and at the time the theory was very much in favour. I was disillusioned when my findings emerged in 2009 and were repeated the second year. My first impulse was to think of a new topic and begin again. I decided to continue with the research, and I began to view the results in a different light.

It is however as a result of the rejection of the VAK theory that the first research question 'are learning styles consistently chosen by individuals'? is presented in chapter three and not in chapter five, (evidencing the learning) where the other research questions are addressed. I have dealt with the first research question in chapter three because it supports the rejection of any claims that VAK theorists might hold that people have a fixed learning preference in terms of VAK.

Despite the rejection of a fixed preference for a VAK learning style, I could not reject all aspects of the theory. Kinaesthetic learning did hold a lot of promise for the primary practitioner and because of this I decided to persevere with this study. As a practising teacher, I had been concerned for some time about the lack of motivation and the failure of many teaching practices to develop metacognitive skills and imagination. As a result of my disillusionment with traditional teaching methods, I had been experimenting with more active learning processes for some time. A large part of the teaching practice was

based on Dorothy Heathcote's Mantle of the Expert (MoE)[10]. Unlike Dorothy Heathcote's MoE, however I use the strategy outside of drama, I use it in Literacy with the intention of improving children's writing not their abilities in drama.

I was aware that in some ways, I was going against contemporary ideologies so as part of my developing ideas I decided to test the use of kinaesthetic methods for efficacy. As part of this process I tested the learning itself but also to ensure that the method did not disadvantage learners with other perceived learning styles, I also tested the learning of the three VAK categories. As a result of the rejection of VAK as a definitive learning theory, this work became an examination of and refinement of a method of teaching taking on a pedagogic focus. The research is intended to improve practice based upon the conviction that learning could be more motivational; it is an examination of educational approaches and processes in order to develop academic practice.

## 1.7 Theoretical underpinning of the work

In recent years, there has been a move towards the curriculum as a body of knowledge; I will discuss this in more detail in chapter three where I look at four models of curricular design. Michael Gove, a Secretary of State for Education praised an American educationalist, Hirsch. Hirsch believes that the underlying purpose of a curriculum is to provide children with the 'core knowledge' they need to succeed. 'The only way to attain... high achievement with fairness to all students is through a structure... that builds knowledge cumulatively' (Hirsch, 2006: xi). The problems with this model of the curriculum will be dealt with in more detail in chapter three, but it does restrict the freedom of teacher and pupil.

The Plowden report criticised the artificial boundaries between subjects and felt that 'finding out' has proved to be better for children than 'being told' (Plowden, 1967: para. 1233). Later in the same paragraph, the report stated 'the gloomy forebodings of the decline of knowledge which would follow progressive methods have been discredited'. The Hadow Report (1931: 93) and the Plowden report (1967) both advocated theme

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[10] Mantle of the Expert is a drama method introduced by Heathcote. The children become experts using resources such as maps, books or artefacts to help them explore the subject they are studying.

based enquiry rather than subject-based knowledge as the primary focus of primary education. Though the 1988 National Curriculum does not specify a teaching method, it was subject knowledge-based and for this reason encouraged a secondary dominated teaching style.

This research developed into an exploration of a different way of teaching from that proposed by Hirsch and Gove. It developed into an investigation about a more active, investigative, dynamic, fun filled approach to delivering the curriculum. This work reflects the philosophy that underpins the educational belief of the Reggio Emilia Approach. 'Within the Reggio Emilia Approach, the fundamental belief on which the image of the child is constructed is that of the child having rights rather than simply needs' (Hewett, 2001: 96). That view of the child in turn draws upon the constructivist view (discussed in chapter two) of the learner as constructing knowledge for themselves. The focus of the Reggio Emilia Approach is based on the ideas of Piaget especially in terms of the emphasis upon 'active education'. Though the approach draws upon Piaget's theory in many other ways as well, 'it also has sought to expand and overturn many of his theories' (Malguzzi, 1993). Thinking in the approach is developed through projects or in depth studies. Through these projects, children explore, observe, question, discuss, hypothesise, represent, and then proceed to revisit their initial observations and hypotheses in order to clarify or refine their understanding. This relates to Dewey's belief that 'all thinking is research' (Dewey, 1966: 148). I hoped that the activities used by me would develop the thinking of the children through the same processes.

In terms of its view of the social aspect of learning, the Reggio Emilia Approach goes beyond the social view of the child in Piaget's theory. In Piaget's theory the child constructs knowledge 'almost in isolation' (Hewett, 2001: 96). The social strand of this research is more in tune with that of Reggio Emilia (Thornton and Brunton, 2009). In this research and that of the Reggio Emilia Approach, there is a strong emphasis on children's construction of knowledge through their relationships. The construction of knowledge results from collaboration, dialogue, conflict, co-operation and negotiation with both other members of the class and adults. This work, in common with the Reggio Emilia approach also places a major emphasis upon the importance of language. The ideas of Vygotsky are important to both this work and that of the Reggio Emilia

approach. Vygotsky believed 'thought and language are operative together to form ideas and make a plan for action' (Malguzzi, 1993: 79).

Mental aspects form the second strand of this work such as the nature of the human mind. There are two ways of viewing the nature of the human mind (Bruner, 2009); the first is that it is like a computer in which information is processed, coded, inscribed, sorted, collected and retrieved. The second view of the nature of the human mind is that it is formed by and realised in the use of human culture. The two views clearly have very different attitudes to both the nature of the mind and of how it should be cultivated. The extreme standpoint of this theory is that mind could not exist without culture:

> This brings us directly to the second approach to the nature of the mind- call it *culturalism.* It takes its inspiration from the evolutionary fact that mind could not exist save for culture. For the evolution of the hominid mind is linked to the development of a way of life where "reality" is represented by a symbolism shared by members of a cultural community in which a technical- social way of life is both organized and construed in terms of that symbolism. (Bruner, 2009: 160)

The nature of the human mind affects how learning occurs. I will refer to these notions of the human mind in chapter three when I will discuss the types of curriculum. Later, in chapter seven, I will argue that the mind can and does exist independently of a social structure or societal norms, but the nature of that mind might be changed or become different.

A second aspect of the cognitive strand of this research is the imagination, Steiner's theory of education focussed on developing what he termed 'feeling thinking'. Children who are exposed to imaginative forms of learning, 'do not merely have an idea in their heads; they feel the idea, for it flows into their whole life of feeling' (Steiner, 1923: 198). Steiner believed that superficiality in education was the result of a lack of imaginative learning. He viewed knowledge as simply facts to be learned with little depth of insight through rote learning. An emphasis on the learning of knowledge would give little opportunity for growth and would lead to children being 'blunted and dull' (Steiner, 1923: 100). Where knowledge is presented in an imaginative way, understanding becomes infused with emotion, resulting in the development of what

Steiner called 'flexible concepts'. The development of flexible concepts allowed for richer meaning, deeper insight and a more spontaneous desire to learn.

Steiner closely observed the nature of 'thinking' (cognition), 'feeling', (emotion) and 'will' (drive) in learners with their higher aspects of imagination, inspiration and intuition respectively. It was from these close observations that he developed his theory. Steiner argued that perception is an act of will that gives rise to a 'living picture' in the mind. It is through this living picture that we perceive reality in a living way, in other words the imagination works hand in hand with the perception. 'That we perceive chalk as white, for instance, arises out of the use of the will, which through … imagination becomes a living picture' (Steiner, 1996:55-56). To Steiner, a living picture is the experience in our inner world of the outer world reality which is a moment in which pre-conceived ideas do not interfere, this is what Steiner called 'open thinking':

> The living picture which is the nature of the imagination needs to be nurtured, because we tend to move too quickly in our westernised way of thinking we move too readily into fixed concept-formation (Steiner, 1996: 65-66).

Steiner believed that the three aspects of the psyche - thinking, feeling and will - work in unity in an individual brought up in a 'wholesome way' (Steiner, 1996: 94-102). When individuals are subjected to education that emphasises the role of intellectual thinking at the expense of feeling and will, the three aspects are fragmented leading to a fragmentation of the psyche. This can result in the ability to think without engaging feelings or moral will, which according to Steiner, has serious consequences, such as increasing indifference, violence and criminality in society. Steiner argued that the imagination unifies thought, feeling and will in the psyche, giving rise to a wholeness of experience. In an earlier work, he states that 'when a thought is communicated...this thought is the germ both of a feeling and an impulse of will' (Steiner, 1954: 75). This signifies that humans are active internally when their imaginations are engaged, this then generates images, emotions, and energy and enthusiasm. Nielsen (2004: 202-203) found that the view of imagination as a link to wholeness was shared by Dewey (1916), Langer (1953) and Dirkx (2001) amongst others. The present work was an investigation

into a different emphasis in teaching methods and materials that would offer a wholeness of thought through imagination and offer a degree of freedom of thought.

The kinaesthetic aspects of the research which form the third strand derive from the work of theorists such as Piaget (1936) in terms of learning by doing and Montessori (1933) for her use of physical resources. Bruner developed Piaget's ideas and developed the 'discovery as learning' approach in which a child's independent investigation helps them to understand and remember crucial concepts. It is important that adults encourage and allow children to discover for themselves. Adults encourage learning by 'giving them room for experimentation (and) letting them decide upon the way an activity is performed' (Lavers, 2005: 8).

The full range of learning strategies is only developed through play; the role of play in schools as a learning strategy has long been recognised, and it is used extensively in the infant years. For some reason, it is then halted in favour of more mature forms of learning in the junior years. During play 'children are empowered, they take control, take risks, overcome failure, consolidate skills and understanding, think creatively and imaginatively and above all, learn positive attitudes about themselves as learners' (Bennett and Handerson, 2013: 176). Play is one of the topics discussed in chapter two, Literature on Learning; the chapter explores a range of strategies used in this work.

### 1.8 Summary

This work changed direction half way through and developed into something that I had not envisaged at the start. Three important strands now run through the thesis, cognitive, kinaesthetic and social All three aspects of this work are I believe important to education. There are a plethora of learning theories as outlined in this chapter, what is not needed is another. This thesis does not offer a new learning theory, but it does result in a new fusion of concepts.

# CHAPTER 2

## LITERATURE ON LEARNING

### 2.1 Introduction

This chapter is divided into three sections; the first section presents the framework and the second section is about the processes involved in the teaching and learning that relate to the second strand (the cognitive strand). The third part is devoted to the kinaesthetic strand and involves the pedagogic practices. The framework is the umbrella under which the research was carried out. It includes the paradigm, constructivism and relates to the social strand of the research. I will begin by defining kinaesthetic teaching and learning.

As stated in chapter one, the study quickly changed from an investigation into the virtues of VAK to a study focussed on the use of kinaesthetic teaching. Kinaesthetic teaching in the context of this research became more than the definition in VAK. I use the terms Kinaesthetic teaching and learning in a much wider sense than they are usually used in the literature. I use the term kinaesthetic when children learn by doing, or when children learn through their experiences of play, role modelling or acting out a scenario. I use kinaesthetic in relation to children's learning by modelling things including model buildings, characters and even concepts. The sense in which I use kinaesthetic learning also incorporates Dorothy Heathcote's Mantle of the Expert (MoE), 'an approach that places the child at the centre of learning' (Whyte, Fraser and Aitken, 2013).  I use the terms kinaesthetic teaching and learning because the study originated from VAK, in which the term kinaesthetic is used. The definition of the term 'kinaesthetic' is synonymous with David Kolb's 'experiential learning'. The terms are used by Zimmerman (2002: 410)

> I first experimented with active, experiential learning on a whim. Frustrated one day with an unusually slow class and fearing a midsemester slump, I decided on a kinesthetic exercise to shake up the class.

Later she discusses a kinaesthetic activity involving poetry in relation to David Kolb directly:

> In one of the few extended treatments of this topic, David A.Kolb (1984: 21) identifies a cycle of experiential learning in which learning moments and subsequent, or even simultaneous, reflection drive one another. I continue to reflect on the possibilities of kinesthetic learning in a literature classroom, and as I experiment with active learning strategies, I join my students in revising my assumptions through extraordinary experiences. (Zimmerman, 2002: 412)

Other terms synonymous with kinaesthetic or experiential have also been used. Felder and Silverman (1998) developed a learning style with four dimensions, sensing, visual, active and sequential. The active learning style is described as belonging to students who learn by trying things out and enjoy working in groups.

> Each of the stated dimensions has parallels in other learning style models, although the combination is unique to this one. The active/reflective dimension is analogous to the same dimension on the learning style model of Kolb. (Felder and Spurlin, 2005: 103)

Terms in different learning models are used to mean the same things. Kinaesthetic teaching and learning mean the same as Kolb's experiential learning and as Felder and Spurlin's active learning.

Having defined the term kinaesthetic, I would now like to turn my attention to teaching in general. I developed a different approach to my teaching as I was conducting this study. The emphasis was no longer upon the teacher teaching didactically but upon the co-operation of the children with the teacher in their learning. This novel teaching emphasis incorporated a number of theories and initiatives; the purpose of this literature review is to expand on these theories and initiatives. I hope to show how some of the initiatives are relevant to this study, I will also outline how the different initiatives interact or complement each other. Below is a diagram of the interaction of the different aspects of the teaching and learning strategy. Mantle of the Expert is shown as the central concept, around it are the other elements of the teaching strategy. The diagram is not meant to be an exhaustive diagram of all of the possible interactions; it is intended to be a representation of the nature of the interactions between the different strategies and elements.

**Diagram 2.1 A diagrammatic scheme of how the different teaching elements interact**



The Learning net

Play

Imagination          Motivation

Mantle of the Expert

Constructivism          Metacognition

Pupil voice
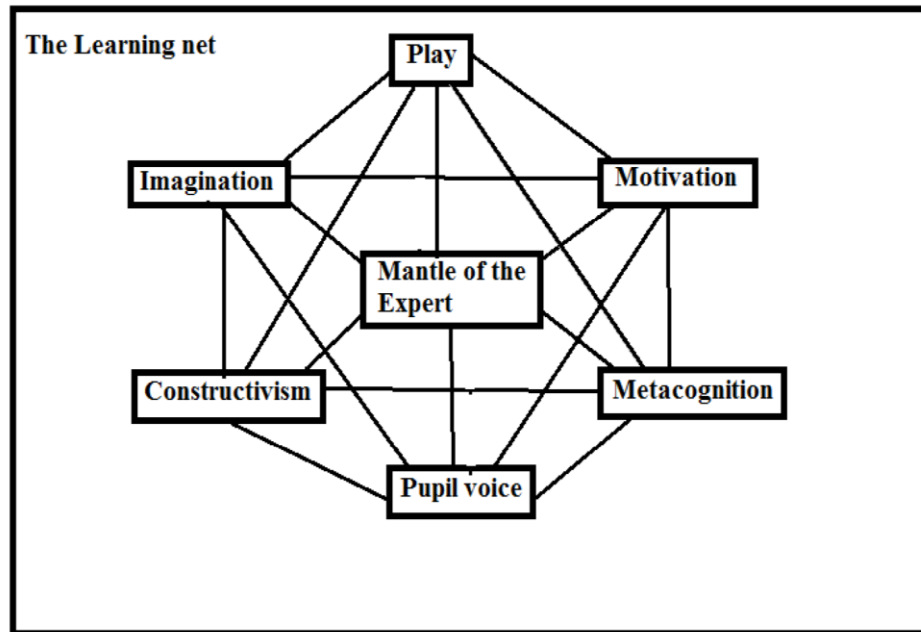
Original schematic net of the elements involved in the present work

An important part of this work was MoE, which formed part of the overall kinaesthetic approach. I adopted the MoE approach because I wanted the children to learn by doing, I did not however realise the full implications of adopting MoE. When doing work in the MoE setting, I was asking the children to become experts in a particular field, for this they needed to be confident and able to give their opinions. The children could not be expected to give their opinions if they were told what to do most of the time; I could not expect them to turn their expert status 'on and off'. The respect given to them when doing the MoE work in story writing had to be extended to all areas to the curriculum. I often found myself asking for their opinions about the work, hoping for suggestions about how it could be improved. When asking for their opinions, I had to be prepared to hear the worst, including derogatory opinions about the work I had planned. I also had to be prepared to change work in the direction they felt it was necessary to take wherever I could. Otherwise, they would not continue to feel that their opinions were valued. In short, I had to discard the 'industrial age assumptions' about learning and schools, notions that:

> include: children are deficient and schools fix them; learning takes place in the head and not in the body as a whole; everyone learns or should learn the same

way; learning takes place in the classroom, not in the world; there are smart kids and there are dumb kids; and competition accelerates learning. (Reid 2010:123)

Pupil Voice (Noyles, 2005) was an initiative that was adopted by the study school; this complemented the MoE method because, through the Pupil Voice, pupils were listened to more in schools. Their opinions were sought (through elected school councils[11] in many schools), about some of the decisions that had to be made. Pupils were asked about issues such as how money can be spent and what they would like to have in their school. Before I begin my discussion of the initiatives I will discuss children's story writing.

## 2.1a Children's story writing

In this section, I will consider the focused learning intentions when the children were writing stories. I attempted to improve the engagement of the children with story writing by using methods that would stimulate their imaginations and their interest. It has long been recognised by authorities, such as Ainscow, et al. that the level of engagement of children is determined by factors from outside schools that affect what goes on inside. To understand inclusion and fairness, it is necessary to understand a range of factors at play:

> …the extent to which students' experiences and outcomes are equitable is not dependent only on the educational practices of their teachers, or even their schools. Instead, it depends on a whole range of interacting processes that reach into the school from outside. (Ainscow et al. 2012, 2)

A range of factors affect how fair and inclusive schools are, and how children learn; these include: factors beyond school, such as political factors; those between schools, such as league tables and competition; and those within a school. Within schools, the factors are:

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[11] School councils are elected bodies of children, typically each class elects one or two pupils to the School council. The council meets frequently and contributes to the decisions made in the school including expenditure.

> …issues that arise from school and teacher practices. They include: the ways in which students are taught and engaged with learning; the ways in which teaching groups are organised and the different kinds of opportunities that result from this organisation; the kinds of social relations and personal support that are characteristic of the school. (Ainscow et al. 2012, 2)

As a teacher, I could not influence factors beyond school or between schools directly, I could however influence those within school. I set out to make a series of activities that were creative, fun and engaging for the children. I hoped to set literacy in the world in which it belongs, and not to separate it out into a world of its own:

> Literature is more than artifice. To suppose otherwise is to 'enclose literature within a world of its own and break off the subversive point it turns against the moral and social orders.' (Ricoeur: 1984, 81)

Story writing is best taught as part of a process in which literacy is seen as a whole. Reading stories and stories telling stories should be part of the process of writing stories.

> Reading stories, listening to stories, telling each other stories, dramatizing stories, talking about stories: these are the contexts in which each of these writers' stories has taken shape. (Armstrong: 2006, 173)

Armstrong discussed the development of one child, Lydia. He states that one can trace the development of her story telling over the course of a year (a year in which she was studied), and he believed that her story telling develops as she gains experience. Armstrong viewed the relationship between storytelling and experience as a 'spiralling movement' that:

> winding back on itself again and again, linking storytelling to lived experience and lived experience to storytelling. (Armstrong: 2006, 173)

Though I was not conscious of it when I set out to design the research, the activities chosen were perhaps an attempt by me to intervene in this spiral of storytelling and experience. The kinaesthetic activities were intended as a means to give pupils an experience that would help them to write. I had hoped to allow pupils to be innovative

and creative through the experience offered to them when writing stories. As Armstrong pointed out, Tolstoy wrote about 'conscious creativity',

> 'in every story, we can recognise the leap of imagination, that 'sudden agile leap of the poet philosopher' as Calvino describes it. (Armstrong: 2006, 174)

The process of story writing is both creative and almost imitative, writers become both 'recipients and innovators, inheritors of a tradition which they recast in accents derived from their own experience, including the experience of immaturity' (Armstrong: 2006, 174).

Through kinaesthetic activities, I hoped to stimulate the imagination of the children. The way in which I organised activities meant that it was essential for pupils to collaborate with each other if they were to gain from the experiences offered. This point was made by Armstrong, he argued that as soon as a productive imagination is placed at the centre of the curriculum, the classroom is transformed into a workshop. The workshop created enables children to become 'partners in a collaborative enterprise' (Armstrong: 2006, 178). The children work together to create, something that I found in the activities that I organised in this study.

The use of dramatisation in story writing has been noted before, 'drama lessons form a rich vein of imaginary experiences from which to write'. (Latham: 2005, 153). She goes on to explain how drama helps children with their writing:

> Having imagined a sequence of action by taking part in it or by watching their peers take part, children have more imagery to call upon in terms of plot and content when they come to write. (Latham: 2005, 153)

Latham (2005, 153) describes two important aspects of dramatisation:

- The process aspect, where children sharing a significant make-believe experience, and where their capacity for imagination is crucial.

- The aspect of performance, where acting and theatre skills are important in the

presentation to the audience.

The first aspect that of process was important to this work, the second was not however important, because the drama was for the sake of the children, there was no one to perform to.

Interestingly, pupils with special educational needs (SEN) were less likely to be isolated, and were more likely to be chosen as work partners by the other children. SEN children are often left out of groups, or chosen last, especially in academic tasks; a point referred to by Dyson:

> It seems that pupils with higher levels of SEN in these classes are less likely to be chosen as preferred working partners by their classmates than are other pupils. (Dyson: 2004, 90)

I put this down to the nature of the 'work'; the children did not see it as work, but more as play. As a result of how they perceived the work, they felt less threatened and they were more willing to choose their friends rather than 'clever' people who could help them with a more challenging task. Children with SEN were seen as being on a level with the other children, because they saw the task as having little or no intellectual content. The next section discusses the initiatives used in the design of the study, I begin with the initiatives involved in the overall framework.

## THE FRAMEWORK

### 2.2 Constructivism

The general paradigm within which the study took place was Constructivism, and so the literature on learning will begin by looking at this concept. Constructivism developed from the work of Piaget, 'Piaget's early work formed the basis of the constructivist movement' (Pritchard, 2009: 20). Individuals construct new knowledge from experience as suggested by Piaget, by a process called accommodation and assimilation. The constructivist paradigm puts the emphasis on the learner and not upon the teacher. The learners construct their conceptualisations and find their solutions to problems and visualisation of concepts; developing their autonomy and independence. The individual

mentally constructs a framework of knowledge within their mind, attaching new information to existing constructs. Constructivism has been defined as 'meaning is not given to us in our encounters, but it is given by us, constructed by us, each in our own way, according to how our understanding is currently organised' (Duckworth, 1987).

Educationalists and theorists increasingly rejected the reductionist theories of the past and embraced newer theories of learning such as contructivism:

> We are in the midst of a major convergence of psychological theories today, cognitive scientists generally share the assumption that knowledge is constructed by learners. (Resnick, 1987:19)

Constructivism has become accepted as a real alternative to the more traditional process-product educational theories and practices, because it appears to address the criticisms of educational practices. Constructivism has the potential, it would appear, to increase pupil satisfaction within school and provide for higher literacy levels, self-reliance and problem solving skills. The emphasis within constructivism is upon the student rather than what they do, it is upon performance assessment rather than on what teachers do. The goal would be to improve student learning rather than improve standardised testing scores (Weinberg, 1989; Elmore, 1991).

Despite the study of Piaget still being a very important area of educational research, the emphasis has changed. Piaget gives the picture of the child learning alone, almost in isolation, working within their immediate environment, deducing ideas about the nature of the world around them. The development of social constructivism added an important aspect to constructivist theory, an aspect ignored by Piaget (Pritchard, 2009:24). Wheldall (2019) said that Piaget argued that children go through:

> a discreet set of cognitive stages- sensori-motor, pre-operational, concrete operational, and formal operational- thereby they develop increasingly sophisticated ways of handling the world of knowledge. (Wheldall 2010:19)

Many attempts were made to design learning environments based upon Piaget's theories in order to test them as his work was deemed to be so significant, for example, the Lab Design Project (LDP), a virtual environment, and the Socrates curriculum, a classroom

environment. Wilson (1996) developed a scheme for classifying constructivist learning environments, which he described as:

> a place where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities. (Wilson 1996: 5)

The work of Piaget had however already become increasingly challenged and called into question in the 1980s, for example, the work of Halford (1989), who questioned the structuralist elements of the theory. Over the last 25 to 30 years, the social aspects of learning have become much more the focus of research, and in particular, the work and theorising of Vygotsky.

Vygotsky's theories placed the emphasis of how learning occurs much more on the social dimension; he believed that the learner constructed their learning within the social environment (Vygotsky 1978). The notion of the learner constructing knowledge in the social dimension came to be called social constructivism as opposed to Piaget's personal constructivism. An important part of Vygotsky's theory that has received much of the attention is the zone of proximal development (ZPD) (Vygotsky, 1978: 84). The ZPD is the area just beyond the understanding of the student. Although Vygotsky himself never used the phrase scaffolding, it has now become closely related to Vygotsky's concept of the ZPD. Interestingly and perhaps surprisingly, Vygotksy never used this term in his writing, it was introduced by Wood and colleagues in 1976. Scaffolding refers to the process in which an educator or fellow class member helps the student develop an understanding of a new challenge or concept. As the student begins to understand, the scaffolding is reduced. 'Scaffolding refers to the way the adult guides the child's learning via focused questions and positive interactions' (Balaban, 1995:52). Scaffolding was used extensively in this study and my teaching, in general. Not only did I offer support to children, but children had study partners with which to discuss ideas or work, and I used child mentors. When a child could not understand a concept after I had explained it two or three times, a child mentor would help them to understand. The child mentor was invariably able to explain in a way that the child would understand.

There are several essential features of a constructivist classroom, 'The construction of knowledge and not the reproduction of knowledge is paramount' (Pritchard 2009:32). Instead of the facts taking centre place, it is the process of learning that is important. Critical thinking can develop where learning leads to multiple realities, especially when learning involves a variety of resources, such as first-hand experience, secondary resources, independent research and dialogue. This variety of resources can lead to alternative viewpoints about the subject under study: the place of the facts in the curriculum has to be subservient to the process of learning. Problem solving learning is also important in the constructivist classroom, this can be used to, 'situate learning in familiar and realistic contexts' (Pritchard, 2009:32).

The learner's framework of understanding should take centre place where new knowledge and concepts are linked and related to pre-existing knowledge and experience. Collaborative work is encouraged so that different viewpoints can be shared, and autonomous learning is encouraged.

Humans have evolved as a social species, capable of learning and teaching through the articulation of words chosen to communicate an idea to others:

> Dialogue with others allows additional and alternative perspectives to be taken into account when developing personal conclusions. Different knowledge, points of view, and understanding can be given and considered before moving on. (Pritchard, 2009:33)

In particular, good modelling by a teacher means that however knowledge is constructed within the mind, there is often a commonly held vision of what has been taught. An example of a model constructed within the mind is the commonly held 'picture' of the structure of an atom. Atomic structure is portrayed as a tiny version of the solar system, where the nucleus is the sun, and the electrons are orbiting planets. Whether this is accurate, or not, does not matter unduly since it helps in the understanding of how atoms function:

> That is learning takes place when new information is built into and added onto an individual's current structure of knowledge, understanding and skills. (Pritchard, 2009:17)

This idea is supported by Vygotsky's dialectic (1978), that of the internal and external aspects of learning and his emphasis on the social environment of learning. In Vygotsky's view, cultures externalise individual cognition in their 'tools.' What is meant by this is that shared physical objects of that culture and abstract social tools such as language and social instruction are the glue of that culture, published earlier, he stated:

> The effect of tool use upon humans is fundamental not only because it has helped them relate more effectively to their external environment but also because tool use has had important effects upon internal and functional relationships within the human brain. (Vygotsky, 1978: 133)

Cognitive change occurs as children use cultural tools in social interactions and internalise and transform these integrations into their knowledge. In the opinion of Vygotsky, all higher cognitive functions have their origins in the individual's social interactions within his or her cultural setting. Commentating upon sociocultural aspects of learning and development within the Vygotskian Framework, Bakhurst stated:

> The nature and content of an individual's mental life cannot be understood independently of the culture of which that individual is part (Bakhurst 1995:159).

Internal factors are however still very important; the internalisation of knowledge in the ZPD is not an automatic reflection of external events. Learners bring their understanding to social interactions and make whatever sense they can of external interchanges and interactions. Often however learners can participate in activities more complex than they can understand, for example, a three-year-old reading a book with their parents. On the other hand, parents and adults might not fully understand the child's perspective but still play an important role in their cognitive development. Through the interaction between learners or children and adults, the exposure to advanced systems of understanding allows change and learning to occur and develop over time.

Learners do not exist in isolation, they are members of a particular culture, and as such they inherit the knowledge of that culture, including its logic, language and

mathematical concepts. Teachers within that culture also inherit the same symbol systems, young children develop their thinking and beliefs through the interaction with each other and the teachers. Culture is, for this reason, important to the learning process through which a child develops. It is against this cultural background that the learner shapes their knowledge and concept of the truth and develops their learning process (Wertsch 1997).

In an earlier work, Von Glasersfeld, (1989) argued that it is the responsibility of the learner to achieve learning. In social constructivism, the emphasis for learning lies with the learner and it is the learner who must be involved in the learning process. This point of view stands in stark contrast to other educational viewpoints, in which the learner played an almost submissive passive role. Von Glasersfeld (1989) stressed that the construction of understanding was achieved by the learner, learners look for meaning and will try to attach new concepts to what is already known by them. It must also be remembered that learning takes place in all contexts and places in which individuals find themselves situated:

> Most learning does not take place in school. Any social interaction with anybody at all may well lead to learning. The building and exchange of thoughts and ideas which takes place in the course of a discussion, in any context at all, is likely for at least one of the participants, and often for both or all of them, to lead to a greater understanding of, or insight into, the topic of conversation. (Pritchard, 2009: 24)

Other assumptions were made about learners, in particular, the level of motivation and where motivation comes from. It is the level of confidence of the learner that is critical; it is confidence that sustains the motivation to learn (Von Glasersfeld, 1989). What is important is the history of the learner, in particular, their experience of the mastery of problems. Past success derived from first-hand experience is far more powerful to the confidence of the learner than any external acknowledgement.

There have been claims that direct instruction is the most efficient method of teaching (with some cognitive components included) (Kirschner, Sweller, and Clark, 2006). There is however, significant support for other types of learning, such as cooperative and group learning. The constructivist model, of inquiry-based learning, was an

important aspect of the current work. Wheldall (2010) also argued that direct instruction was vital to the success of learning. It might be conjectured however, that this may be the result of the ethos of education in general; that it is difficult for a group of learners to adapt to a constructivist model, having been taught for five years in a more didactic, less child-centred way:

> More research is needed into the positive effects of constructivist approaches to teaching and learning, as shown by the positive effects of teaching based upon behavioural approaches. (Wheldall, 2010:24)

Arguments for one type of teaching and learning style might well be evoking the Cartesian anxiety, in which it is 'either this or that'. The argument that one type of knowledge is better than another is misplaced. Children learn best when they are allowed to create their hypotheses, knowledge cannot be transmitted but must be constructed by each within their mind (Wheldall, 2010). Gardner agreed with that argument:

> As a cognitive psychologist, I know that children must construct knowledge for themselves: they cannot simply be 'given' understanding of any important issue. (Gardner, 2002:49)

Wheldall added:

> the idea of a teacher as a knowledge facilitator is flawed since it invokes false dichotomies and confuses motivational goals with instructional methodology. (Wheldall, 2010)

The problem, in short, is that simplistic models of constructivism understate human ability to learn from others through the media of social and verbal interaction.

The study that led to this work had many of the features of the constructivist classroom, in particular, much work in story writing was discovery oriented. Whenever possible, pupils were given tasks that required them to learn through experience and role play, by 'doing' as opposed to being told. Bruner's Theory Into Practice database (TIP), (1966) is a constructivist theory that uses active learning through which learners construct new ideas or concepts and in which learning is an active and a social process. In the context of this research, cognitive development was encouraged throughout the curriculum,

through the employment of thinking skills and problem solving activities. Teaching was both reflective and co-operative, pupils themselves were encouraged to lead parts of lessons and through peer instruction, help to teach others in the class. A range of teaching strategies were used, including rote learning of tables and direct instruction, when it came to the learning of spelling. Much of the work was student centred and infused throughout all areas of the curriculum. The school in which the present study was carried out emphasises individual research using ICT, books, magazines and artefacts. Collaborative learning is highly prized within the school environment as a whole. Several of the sections in this review have academic sounding titles, the next is perhaps more authentic. In essence, when conducting this research, the children were required to play. Playful learning is the next strategy used in the study that will be discussed.

## 2.3 Playful learning

In the context of this research, there are three aspects of play and learning that I would like to address. The first aspect is: why we play; the second aspect is, how play benefits learning and the third aspect is; how play was used in this research. The kinaesthetic methods used in this research could be seen in the context of Mantle of the Expert, or in terms of kinaesthetic activity, but they could also be viewed as opportunities to learn from structured play. The importance of play in schools has been recognised. 'Children learn by leading their play and in taking part in play that is guided by adults' (Statutory Framework for the Early Years Education DfE, 2012: 6). The importance of play has been of interest for some time, in particular, how young children use fantasy play to learn (Wood, 2004), and it is seen as an important tool to use to engage children in the learning process (Kitson and Spiby, 1997). As stated in the introduction, although the importance of play is recognised, its use as a learning strategy is not extended into the junior age range.

From my own observations, the main benefit of play was that children on Individual Education Plans (IEPs) were far less threatened by writing tasks following kinaesthetic activities. One example was the case of 22Sm, a boy who was dyslexic who wrote with confidence following the spy activity and the murder mystery. That might have been the

result of the tasks being less frightening having been thoroughly explored and investigated by the children through play:

> A new experience, if not frightening, is likely at first to attract attention, then exploration. Only after a novel feature of the environment has been investigated can it be treated more lightly and enjoyed. (Garvey 1977:32)

There is no short answer to the question of why we play, but there are many experts who claim that its benefits are enormous. Not all play is conducive to learning, 'play can be regarded as deeply serious and purposeful, or trivial and purposeless' (Wood and Attfield, 2005: 2). Piers and Landau (1980) also discuss the benefits of play, they claim that play:

> … develops creativity, intellectual competence, emotional strength and stability and ..feelings of joy and pleasure: the habit of being happy. (Piers and Landau, 1980:43)

The list of the benefits of play could be almost endless; there are opportunities to explore concepts such as freedom, independence or at a more basic level of repetition. It might be that play can be beneficial to the mastery of a task; then there are the social benefits of play such as empathy. The National Association for the Education of Young Children, stated, 'high level dramatic play produces documented cognitive, social, and emotional benefits' (Copple and Bredekamp, 2009:15).

To quote an earlier work, Dylan Thomas's (1954) description of the intense meaning and relevance of his early pretence suggests, that play affords a very rich set of opportunities:

> Though it was only a little park, it held within its borders… as many secret places, caverns and forests, prairies, and deserts, as a country somewhere at the end of the sea…. And though we would explore it one day… from the robbers' den to the pirates' cabin, the highwayman's inn to the cattle ranch… yet still the next day, it remained as unexplored as the Poles, a country just born and always changing…. (Thomas, 1954:4–5)

In pretence play, children can give meaning to objects that are not necessarily given to those objects (Vygotsky, 1967). A banana becomes a gun, a piece of wood an island; it is through this pretence play that children develop abstract thought (Vygotsky, 1967). Pretence play has a development role (Vygotsky, 1978) because when they (children) are engaged in it, they learn that reality can be separated from objects and actions. Children can learn from play; 'play can also help learning because it can take a child to the upper end of his or her 'zone of proximal development' (Vygotsky, 1978:86). As pointed out by Bodrova & Leong, (1996), through pretence play, in which reality must be inhibited, children also develop inhibitory control.

Perhaps play has an even more liberating effect upon the child: it might be the first opportunity for freedom:

> The creation of an imaginary situation is not a fortuitous fact in a child's life, but it is rather the first manifestation of the child's emancipation from situational constraints. (Vygotsky, 1978:99)

Piaget, on the other hand, believed that pretend play, was less a promoter of development and more of an index. The appearance of pretence play at around eighteen months, indicated semiotic function development. Semiotic function is where objects and events are mentally represented, which in turn allows for language development and imitation. 'The semiotic function to Piaget is the capacity to represent an absent signified object with a present signifier' (Lenninger, 2006:7). Semiotic function separates an idea and referent, an object from its label; a memory is divorced from its context, enabling the child to develop connections and ideas that are very separate from reality. In other words, children can pretend that something is there which clearly is not, or that an object is something that it is clearly not.

Play is often left out of the junior syllabus and lesson plans aimed at those children in the junior years. Even where play is instigated in school by the teacher with the intention of learning, it could be open to criticism. Though well-intentioned teachers do organise play within the classroom, it is, 'not the play children describe with relish and delight many years later' (Fein and Wiltz, 1998:47). Play is not seen as learning. By the end of primary school, physical and imaginative 'play'- the very word is often

contrasted with the serious business of 'learning'- has largely disappeared. Play in school is replaced by the more 'grown up' activities of reading, writing and calculating.

Play is, however, an essential activity, small children under six play, adults play, yet for some reason, in the school setting, those in the junior age range do not play. Vygotsky believed that play could help in the development of a child, he further believed that play was not the dominant feature of childhood:

> Play is not the predominant feature of childhood but it is a leading factor in the development. (Vygotsky, 1978:101)

Play is not a single entity: 'play activities involve a wide range of behaviours and can be situated in different contexts' (Wood and Attfield, 2005: 2). Lillard *et al.* (2013) analyse the literature to evaluate how pretend play affected children's development. They identified pretence play and naturalistic play but within these classifications there were other subdivisions:

> Naturalistic classroom play has been categorised differently in different studies, but a combination of schemes has been used most often. (Lillard *et al.*, 2013:4)

Buehler and Hetzer (1935) performed a study of how symbolic representations of things develop at different stages of a child's development between the ages of three and six. Their experiments were divided into four stages.

- The first investigated the function of symbols in children's play.

- The second involved building materials.

- The third involved drawing with coloured pencils.

- The fourth was a game set at a post office. In this, the game used differently coloured pieces of paper to denote different items such as telegrams money or mail.

The only common feature was that symbolic function was a component of the games. Buehler and Hetzer (1935) were able to differentiate which symbolic meaning arose in figurative gestures and which via words. The researcher was able to divide the children into four groups. There were those who used movements and mimicry, but not speech and those who did not play at all. Speech became the sole mode of representation, mimicry and gestures did not play a part in their play. The most important conclusion is that the difference in play between three and six-year-olds is the mode in which various forms of representation are used, not the perception of symbols. This research is important in another way, however, in that it demonstrates how play changes for different age groups. For the purposes of this research, the play activities chosen to become modules of kinaesthetic work had to be pedagogically suited to the age of the children involved. Activities selected for  play were not play for play's sake but play that was suited to their age group.

There are different forms of play that are discussed in more detail later in this section, one form is fantasy play. It is hard to say how play benefits children in terms of learning, 'the potential benefits to be gained from fantasy play are difficult to quantify' (Kitson, 2015: 266). Three ways in which fantasy play might benefit children were outlined by Singer and Singer (1990):

- Actual spontaneous verbal output (around 50%) in socio-dramatic play
- A corresponding increase in social interaction
- A significant improvement across a range of cognitive skills after 'training' in imaginative play.

The major strength of play is that individuals, whether adults or children, can play in their own way, and learn by drawing from the experience whatever they are ready to learn at that time. Children learn most when learning is based on what is already familiar to them. Moyles gave two scenarios where children played in a classroom setting (Moyles, 2005:18). In the first, two five-year olds built random shapes with constructional blocks until they fell down. In the second, a seven-year-old is set a challenge by the teacher to make biscuits from a 'sausage' that the seven-year-old had made from shortbread dough. In the case of the first scenario, the children learnt little;

eventually they giggled, ran off then pursued another activity. In the second, directed activity the child estimated assessed and measured, in so doing, the child learned to apply skills or acquired new skills. The child in the second task also used mathematical language appropriate to the task, 'Oh, it won't go in half!' or 'What's half of fifteen?' Eventually the seven-year-old child discovered that they could fit 16 fingers onto the length of dough, and so the child counted '16, 8, 4, 2, 1., then decided it was possible to make 16 biscuits.

The new learning made by the seven-year-old in the second scenario was made against what was familiar and so, it came naturally to them. When adults and children formulate their play, what is learned is governed by experience:

> Playful choices have nothing to do with chance. When we fall back upon the playful we fall back upon the understanding we always rely on... falling back on what we know best. (Hans, 1981:185)

Learning that is appropriate and which is organised so that it is done in stages gives the child more confidence to know more:

> Learning is essentially a growth, not an accumulation, and it must always spring from and return to what is known. (Claxton, 1984:216)

By learning from what began as familiar, the child would be more willing to take risks and to not view getting something wrong as failure, but as learning. As a result, the learner is willing to take risks in their learning:

> Good learners take their time, don't mind asking questions, aren't afraid of saying 'I don't know' or of being wrong, can change their minds and enjoy finding out. (Claxton, 1984:219)

Perhaps by using what children are most familiar with, play, schools could encourage them to explore, investigate and become more willing to take risks with their learning.

There are many ways in which play benefits learning, play is an essential part of the human experience. It is beneficial to the development of the mind, the imagination and

to our emotions. 'The need to be playful is essential to human intellectual growth and emotional well-being' (Broadhead et al, 2010: 114). Play develops over time and it allows an important aspect that is often overlooked by teachers, that of the freedom of the child within the classroom. It has been argued by Parker-Rees (1999) and Hope (2008) that being playful allows children to ensure an activity is meaningful to them, and to cope with their need for personal freedom in spite of social constraints which may arise from interaction with others.

There are a number of constraints that result in teachers' restricted use of play in the curriculum. The demands include the need to address the National Curriculum, space, resources, the timetable, expectations of colleagues and parental attitudes. One of the major problems with play is the lack of a record of the activity:

> The teachers felt that they had to justify play by providing evidence of children's learning. This was problematic because written forms of evidence are given a high priority, and play provides few opportunities for this. (Bennett et al, 1997: 119)

This has been partly addressed in more recent years, through the use of technology, teachers sometimes use photographic evidence to keep a record of activities carried out that do not provide opportunities for a written record.

Play could have been organised in one of many different ways within the classroom setting: it could have been independent, teacher-led, or organised within a group setting. In the present study, play was almost exclusively organised as a group activity, where children were required to cooperate and work together. The benefits of play are endless, but the most beneficial form of play to learning is that which is teacher-led or teacher-directed:

> Observational studies have shown that a free-play setting has potential for stimulating learning in young children… it must be carefully structured with the adults playing a crucial role in its organisation and by selective intervention with the children in their 'play'. (Moyles, 2005:167)

Children seem to play effortlessly, whereas they sometimes struggle with their work. For some children, this struggle can be almost continuous. Kitson discussed the use of play and how it could be used to teach children. He outlined a few ways in which play could be used, 'we could just let children get on with it by themselves', on the other hand, 'we can shape the game' (Kitson, 2015: 263). By shaping the game, children could be challenged and their understanding stretched 'without ever having to formally teach them' (Kitson, 2015: 263).

Role play is the most commonly used form of play by teachers and it is used in a number of curriculum areas, but most notably within literacy. Teachers are perhaps more willing to use role play because of the way it is structured, it 'marked out the distinction between 'play' as such and play 'in schools'' (Bennett et al, 1997: 118). Teachers fear that play is not seen as educationally viable, that it cannot be used to promote learning unless it is something done by those in the early years. 'Play should be educationally worthwhile and integral to their management of learning' (Bennett et al, 1997: 118).

Teachers are less ready to use other types of play, especially fantasy (mentioned above) and socio-dramatic play. Fantasy play develops as children grow, its diversity and level of maturity changes, yet this is ignored as a tool by teachers. 'The manifestation of the fantasy element (the play) develops as the child grows older' (Kitson, 2015: 266). Fantasy play unifies different aspects for children:

> Fantasy acts as a way of unifying experiences, knowledge and understanding, helping the child to discover links between individual components. (Kitson, 2014: 266)

Even when teachers use play, they are often misguided as to the usefulness of play to learning. Teachers often believe that they are developing activities that encourage play through learning, but in reality they are not:

> Perspectives from practice reveal tensions between rhetoric and reality of play. The commonly held view that early years teachers encourage learning through play is more myth than reality. (Wood and Attfield, 2005: 9)

Work is often disguised as play because teachers attempt to meet the learning objectives dictated by the National Curriculum. The needs and rights of children are ignored:

> While policy discourses emphasize the need for 'more challenging work', there is no acknowledgement of children's needs) and their rights) for more challenging play. (Wood and Attfield, 2005: 9)

Social skills, creativity and intellectual growth can all benefit from socio- dramatic play. Amongst benefits of this form of play, children can create new combinations out of experiences. It can also help children to concentrate, a skill which might be transferred to the classroom. Children can also develop social skills such as self-discipline, empathy and the ability to listen to others. When teachers are able to intervene in fantasy and socio-dramatic play, skilful interaction can stimulate and act as a catalyst (Moyles, 1989).

The distinctions between Mantle of the Expert, the use of imagination and the use of play are not clearly defined, the edge where one blends into another is blurred. In the context of this research, the three became one in the form of the activities set; in fact it became difficult to distinguish between different aspects of teaching while conducting the research:

> Isolating features of classroom life is not only dangerous but often gives a distorted picture. The day is so complex and diverse that to adopt any one part of it for discussion may be doing all participants an injustice. (Moyles, 2005:85)

Imagination might be a casualty of the new National Curriculum with its demands to fulfil learning objectives in literacy and numeracy. This might lead to long term problems for the child:

> Creativity and imagination are important to lifelong learning and playing because they embody divergent forms of thinking and lead to novel, innovative combinations of ideas and experiences. (Wood and Attfield, 2005: 84)

The Reggio Emilia approach offers an alternative model of the curriculum, it is one that 'empowers children with tools for thinking', (Wood and Attfield, 2005: 84). It also enables children to:

> develop positive dispositions towards learning, and enable them to explore ideas, experiences, feelings and relationships. (Wood and Attfield, 2005: 84)

Play as a process fulfils many of the needs of young children, by which in this context, I include children in the junior years. Those needs of young children were listed by Moyles (2005:23) and include the opportunity to:

- Practice, choose, persevere, imitate, imagine, master, gain competence and confidence.

- Acquire new knowledge, skills, coherent and logical thinking and understanding.

- Be given opportunities for creating, observing, experimenting, moving, cooperating, sensing, thinking, memorising and remembering.

- Communicate, question, interact with others and be part of a wider social experience in which flexibility, tolerance and self-discipline are vital.

- Know and value one's strengths and understand personal limitations.

- Be active within a safe and secure environment which encourages and consolidates the development of social norms and values.

The kinaesthetic activities developed for this research used all of the needs or skills above. Co-operative needs were very important to the research work, and I hoped to use the research to encourage the children to help each other and to use it to improve their social skills. The children began to realise that they had to work together in order to succeed on the tasks, they began to learn about their strengths and those of others. When organising themselves for the murder mystery investigation, one child, 14Ax said:

> I'll read the character profiles, if you (27Mi) read the other information because you're good at organising, and you two (8BeH and 7Ma) highlight the important information in the newspapers and the CCTV camera.

This was particularly interesting, and I noted down what was said, because the perceived strengths of the children involved were very similar to how I saw the strengths of the individuals that made up the group.

The activities, especially the spies and murder mystery, encouraged logical thinking. Working through the tasks, children often became more willing to take risks because they perceived the work as play. By taking risks, they persevered and tried again and again at tasks until they either succeeded or ran out of time. All the activities required communication both written, verbal and in some cases they required the use of symbols or body language. It was possible to help children learn about themselves. Sometimes this learning was achieved  by pointing out that one child had not taken a turn, or that one was dominating, or that one was not contributing or being allowed to contribute. The views of all children were listened to, and they had to be given equal weight if all of the children were going to benefit from the strategies being used. The development of an awareness of the domination of a group took time to develop and was achieved through individual chats or group discussion. The need for children's contribution was recognised at government level with the introduction of Pupil Voice.

## 2.4 Pupil Voice

The policy of Pupil Voice was one of a number of government initiatives. 'A range of policy developments have supported the move towards greater consultation with children and young people on matters that affect them' (Whitty and Wisby 2007: 12). The United Nations Convention on the Rights of the Child (UNCRC) of 1989 was ratified in the Children's Act, implemented in 1991, that made it a legal requirement for young people to be involved and consulted in decisions that affected them. Pupil Voice is defined as an increase in the influence of the children in terms of their education, where the pupils themselves have an increasing influence on their school. Pupil Voice was brought about as a mechanism through which children might influence their schooling by having their views listened to in schools. It began as an initiative in the National Curriculum in response to article 12 of the UNCRC, which called for the right to:

> assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the

child being given due weight in accordance with the age and maturity of the child. (Article 12)

Pupil Voice has two different meanings; the definitions are given below:

> Pupil Voice can mean, and is often intended to mean, very different things. As Hargreaves (2004) outlines, in its widest sense, Pupil Voice includes every way in which pupils are allowed or encouraged to offer their views or preferences. In this sense, all teachers from time to time encourage and are involved with Pupil Voice. Taken more narrowly, Pupil Voice can be understood as pupils having the opportunity to have a say in decisions in school that affect them. It entails pupils playing an active role in their education and schooling as a result of schools becoming more attentive and responsive, in sustained and routine ways, to pupils' views. (Whitty and Wisby, 2007:20)

Specific reference to the UNCRC has been made in recent policy documentation in England. For example, in 2008, guidance from the Department for Children, Schools and Families (*DCSF*, 2008), Working Together: listening to the voices of children and young people-made reference to the UNCRC. It emphasised the need for schools to promote children's well-being and that this requirement is supported by the UNCRC (2008: 3). It also clearly stated there was an expectation that schools ensure that the views of children and young people are heard and valued in the taking of decisions which affect them.

It stressed that 'Schools are strongly encouraged to pay due regard to the Convention' UNCRC (2008: 3), and outlined that the involvement of children and young people in decision-making would encourage children to become active in the democratic process and that it would contribute to the achievement and attainment of pupils. Other potential benefits of engaging children in making decisions were an increase in self-respect, improved motivation, an improved sense of responsibility and pupils more engaged with their learning.

The idea of a didactic transfer of knowledge from the head of the teacher who knows all to the head of the children who know little was criticised by Freire (1998), when he argued that:

> ...teaching cannot be a process of transference of knowledge from the one teaching to the learner. This is the mechanical transference from which results

machinelike memorization, which I have already criticized. Critical study correlates with teaching that is equally critical, which necessarily demands a critical way of comprehending and of realizing the reading of the word and that of the world, the reading of text and of context. (Freire, 1998: 22)

Enabling the students through Pupil Voice might afford the opportunity to change the power relations within schools. The use of the term voice implies the sound of children speaking. Through the use of the word voice, it enables us to think of the sound, the presence, participation and power of individuals or a collective. Cook- Sather (2006) argued that student voice as a term:

> Asks us to connect the sound of students speaking not only with those students experiencing meaningful, acknowledged presence but also with their having the power to influence analyses of, decisions about, and practices in schools. (Cook-Sather, 2006: 5)

There are several benefits of the implementation of Pupil Voice. The first is that it necessitates a change in the relationship between pupils and teachers. Teachers can learn from students:

> Learning from student voices... requires major shifts on the part of teachers, students, and researchers in relationships and in ways of thinking and feeling about the issues of knowledge, language, power and self. (Oldfather, 1995: 87)

Changing the power dynamics of the classroom enables pupils to see the political potential to speak on their own behalf. It could encourage pupils to see how they can become involved in the decision making process and of the benefit of the democratic process, this would enable pupils to see their rights as citizens.

Another positive aspect of Pupil Voice is that it enables students to feel respected and engaged in the classroom. In her paper on student voice, Sanon et al (2001) quote an African- American senior, Maurice-Baxter, 'you can't have good communication without respect. If I don't respect you, we can't communicate'. Respect promotes more constructive participation, it allows students and teachers to learn from one another.

Another positive that emerges from Pupil Voice is that when pupils speak, teachers and adults must listen. As I found in this study, by listening to pupils, teachers can improve

their practice, they can become better at teaching. If teachers were to go one step further and engage pupils in what they value and actually want to learn about, education might move forward at a faster rate.

There are of course, misconceptions associated with Pupil Voice, as there are with any initiative. We must be aware that voice does not become accepted or viewed as a single entity. Voice must not be taken to mean that pupils have a single view, it must be ensured that dominant groups, those seen as cleverer or more popular, do not monopolise what is said. The democratic aspect of Pupil Voice must be emphasised. It might also become tokenistic and over simplistic, with an attitude amongst teachers, that they've been asked, so 'we can tick that box'. A further issue that will almost inevitably emerge is that we might hear things we do not want to. If we ask the question, 'it presents challenges that some may not be willing to face, particularly listening to things we don't want to hear (Cook- Sather 2006: 11).

Cook-Sather (2006: 11) points out that there are two vital aspects of Pupil Voice that emerge from a 'shift in the power relations, dynamics and participation': they are 'rights and respect' the rights of the child through Pupil Voice is:

> 'a call for a cultural shift away from an adult-centric, infantilizing, and disempowering set of attitudes and practices and towards a culture that supports students  as among those with the right to take their place'. (Cook-Sather 2006: 13)

Whilst some schools have gone some way to implementing Pupil Voice, others have hardly given it any consideration. Even in the schools that have begun to ask pupils for their opinion, there is a limit to the involvement of the children in their learning, whilst they might be consulted on some issues, they are excluded on others.

> ...while many teachers and school leaders acknowledge the benefits of developing learning partnerships between teachers and pupils, their preoccupation with the assessment and standards agendas serve to offset the extent to which they are prepared to involve pupils in decisions about their own learning. (Robinson, 2014: 9)

The exclusion of children from some aspects of learning means that a valuable resource, the children themselves are not consulted. The people most often aware of what they need to learn, how they learn and who it is that best explains (they themselves) are not consulted.

> Pupils have the experience of being involved in a wide variety of learning activities, they are a rich resource, and they have a wealth of ideas about what supports their learning; it is, therefore, a missed opportunity to keep pupils on the periphery when it comes to discussing and setting learning agendas. (Robinson, 2014: 9)

In the context of this research, Pupil Voice manifested itself in a number of ways and at different stages of the research process. The views of the children were initially requested when they were engaged in the work, in the activities of being spies or detectives in the murder mystery. Pupils were also asked for their opinions about the work as an ongoing process; their views were listened to and discussed in circle time, and the views of every child were valued and explored through discussion. Wherever possible, their ideas were used to improve the work that they were subsequently presented with. After an activity had finished, pupils were asked to recount their experiences on questionnaires. Some work changed dramatically as a result of the input of the children, most notably the work on the murder mystery, which I had planned as a huge version of the board game Cluedo. The children suggested that the game should change to a detective-style investigation. I asked for their suggestions and used them to develop the work, two girls showed a particular interest in the work and helped me to plan much of the detail of the murder mystery. In the next section, I will look at the processes involved in the teaching and learning.

Pupil Voice offers the potential for change, as long as it is not treated in a tokenistic manner, and if properly implemented and adhered to by those in control of the curriculum and school leaders. Not only does it offer the chance for a change in the power structures within educational establishments, but it also offers the chance for purposeful learning in which children are more engaged and committed. Through opportunities for authentic dialogue and feedback, knowledge might be constructed in partnership, rather than supplied by didactic teaching:

…teacher of the students and the students of the teacher might cease to exist … discovering knowledge through one another and through the objects they are trying to know. (Freire, 1976:115)

## THE PROCESSES

The processes form the second part of the chapter, the processes relate to the cognitive strand of the research; I begin with a discussion of the role of motivation.

### 2.5 Motivation

Motivation was of vital importance to this study because it was essential to the process and the findings or outcome that the children were keen to undertake the activities. On another level, it was important that they were motivated to succeed and do well for their sakes as well as for my sake (in terms of performance management) and that of the school. Through reading, it soon became apparent that motivation often came from a certain type of belief system. The belief system was one in which the child perceived themselves as failing or as being less intelligent than others in the class (Dweck, 1999b):

> For instance, poor ability beliefs would likely result in poor academic performance, low academic self-esteem, and a higher intent of withdrawing from high school. Poor effort beliefs might also affect academic achievement, yet a retraction of effort is mostly likely to lead to undesirable academic behaviours. (Legault *et al.*, 2006:570)

Motivation is about far more than just being happy or satisfied, to fully understand the concept; an understanding of the willingness of the individual to expend effort must also be included. Theories of motivation are divided into two groups, they are, process theories (Skinner, 1938) and content theories (Maslow, 1943). Content theory or control commitment attempts to explain what empowers or begins certain behaviour.

Maslow's Hierarchy of needs (Maslow, 1943) is perhaps the best known theory of this type. Such theories have been developed further for example by Friedlander (1963) who looked at what determined the personal performance and satisfaction of the individual. The expectancy model (Vroom, 1964), suggests that individuals are motivated to work

when they succeed in achieving what they set out to achieve. Process theories, such as the theory of Locke and Latham (1990), look at the goals of the individual and attempt to explain how certain behaviours are initiated and then sustained at a certain level.

Some motivation theories concentrate on intrinsic (from within the individual) and extrinsic (outside the individual) motivators. It was in experimental studies into animal behaviour that intrinsic motivation was first described. It was found that many organisms engage in exploratory, playful, behaviour even when there is no obvious reward (White, 1959). Deci & Ryan (1985) distinguished between different types of motivation in their Self-Determination Theory based on the different reasons or goals that give rise to an action. The most basic distinction is between intrinsic motivation, which relates to performing an action because it is enjoyable or interesting in itself, and extrinsic motivation, which refers to performing an act because it leads to an outcome that can be separated. Motivation might be the result of belief systems, which would be intrinsic factors, and different people create different meaning systems:

> My work is built around the idea that people develop beliefs that organise their world and give meaning to their experiences. These beliefs may be called 'meaning systems'. (Dweck, 1999, xi)

Dweck thought that there were several beliefs in society that were commonly held and which must be challenged; those beliefs can be summarised as:

- The belief that students with high ability are more likely to display mastery-oriented qualities.
- The belief that success in school directly fosters mastery-oriented qualities.
- The belief that students' confidence in their intelligence is the key to mastery-oriented qualities.

Dweck (1999) agrees that success, praise and confidence are appealing and that success and praise are preferable to failure and criticism. She does, however, argue that confidence is not at the heart of motivation or the key to achievement. Mastery-oriented qualities grow out of the way people understand intelligence, and there are two very different ways of viewing intelligence: the theory of fixed intelligence and the theory of

malleable intelligence. The theory of fixed intelligence requires a diet of easy success; challenges are a threat to self-esteem.

Students with mindsets that follow entity theory will constrain their own learning under entity theory, 'intelligence is portrayed as an entity that dwells within us and that we cannot change. So learners will readily pass up chances to learn which might reveal inadequacies or entail errors' Dweck, (1999b: 2). When attempting to boost self-esteem, the educator can encourage vulnerability by praising intelligence we do not foster a hardy can do mentality but may foster an entity theory in which the pupil is overly concerned with looking smart. As a result, they tend to dislike challenge and exhibit a decreased ability to cope with setbacks.

The theory of malleable intelligence has a very different definition of intelligence, in which intelligence is not a fixed trait that individuals possess, but instead, it is something that can be developed through learning. This is called incremental theory of intelligence, because intelligence is thought of as something that can be increased through work effort:

> This view, too, has many repercussions for students. It makes them want to learn. After all, if your intelligence can be increased why not do that? Why waste time worrying about looking smart or dumb, when you could be becoming smarter? And in fact students with this view will readily sacrifice opportunities to look smart in favour of opportunities to learn something new. (Dweck, 1999:3)

In another study, performed just over a decade before by Dweck and Leggett (1988), students were asked about their theories of intelligence: this was achieved by asking a series of questions. The researchers found that there was a clear and distinct relationship between the students' theories of intelligence and their goal choice. Those who believed in the entity theory of intelligence (intelligence is fixed) chose in the main, performance tasks (80%). Those who believed in the incremental theory (that intelligence can be increased) were more likely to choose a learning goal (60%). Those with a belief in a more malleable form of intelligence orientated towards learning goals. This research would seem to indicate that the belief of the individual is important not only to their

choice of goal, but also to their response to failure and for this reason to their motivation towards their work.

Earlier still in 1978, Diener and Dweck looked at the way in which students tackled problems. Their study involved several tasks that were achievable followed by five that were beyond them; the latter having been designed for much older children. What they found was that 85% of pupils divided roughly down the middle into the mastery-oriented group and the helpless group and that 15% could not be adequately categorised. Within the mastery-oriented group, students relished the challenges; whereas in the helpless response group, they gave up as soon as the problems became too difficult. What was interesting was that within the latter group, the helpless response, as soon as pupils faced a challenge that they could not immediately overcome, they responded in one of two ways. Firstly, some recounted areas in which they were successful, telling researchers of their selection for a lead part in a play and the like; the second reaction was to express boredom. The mastery-oriented group on the other hand responded to the failure differently (Diener and Dweck, 1978).

In the experiential work carried out by the children in the present study, none complained of being bored at any time, and none became distracted. This would suggest that when working kinaesthetically (or experientially), children are not only focussed, but exhibit mastery-oriented responses to the tasks set for them. Pupils worked in mixed ability groups to compete some quite challenging tasks, such as cracking codes in the spy activity. The mastery-oriented response was exhibited by pupils of all 'learning styles'. Those learning styles included visual, auditory, no preference (by which it is meant that they exhibited no particular preference towards a learning style) as well as kinaesthetic learners. Pupils of all abilities were able to dissect the problem-solving processes involved in the task, breaking the task down into manageable stages of operations. It might be interesting to postulate that the mastery-oriented response might be exhibited by all pupils, including those who could be described as the helpless group, if the task set was purposeful and had a clear goal. It might be that the nature of experiential activities, lend themselves to a mastery-oriented response.

Motivation is determined, at least in part, by the attitude to problems encountered by the pupil. All students are likely to encounter problematic material at some stage of their

academic careers. If they are intelligent, and used to praise as well as success, but have not often been challenged by difficult tasks, they might well fall into the helpless group. If, as educators, we wish to motivate students, we should strive to engender the mastery-oriented response in children. The mastery-oriented response is not achieved by giving praise and easily achievable goals. Neither is it achieved through 'easy' tasks but by the inclusion of tasks that by their nature will challenge pupils to the realisation that failure to complete a whole task is part of the learning process. We should foster the ability to reduce tasks to manageable parts and to understand through meta-cognition where the problem lies to their understanding of the task at hand. In so doing, pupils will not become demotivated when they face tasks that are too difficult, but instead will have a resilience to overcome their problems. They will be able to break the task into manageable 'pieces', and they will be able to identify where the task becomes too challenging:

> If obstacles are seen as posing a real threat and if they prompt grave self doubts and withdrawal, then the pursuit of these goals will surely be compromised. (Dweck 1999:13)

There are two types of goals, the performance goal and the learning goal (Dweck, 1999). The former is about winning praise and positive judgements from others, and trying to avoid negative ones. An overemphasis on performance goals should set the alarm bells ringing for the teacher:

> When students pursue performance goals, they're concerned with their perceived level of intelligence: They want to look smart (to themselves or others) and avoid looking dumb. (Dweck, 1999:15)

The second type of goal, the learning goal is where pupils have the goal of increasing their competence, it reflects the desire to learn new information or develop a new skill. In an ideal world, both goals would be achievable, but in reality, in the world of education, the two goals are often in conflict, which begs the question of which is the most important? A study by Elliott and Dweck (1988), looked at the nature of the two goals. The study found that when children set themselves performance goals and fail because they focus on measuring themselves from their performance, they exhibit the

helpless response. When children focus on their learning, failure is more likely to provoke more continued and sustained effort.

The theories outlined above, have implications for predicting behaviour patterns that relate to the learning of children. Atkinson and Feather found as early as 1974 that those with higher levels of academic achievement have a greater orientation towards approaching success. This can be explained as follows, pupils who approach success more than they try to avoid failure are more likely to select challenges that are challenging to them. Those who have a tendency to try to avoid failure are far more likely to maintain their ego through choosing activities that do not challenge them, but in so doing, tend to be poorer in learning opportunities. Their findings are supported by Dweck's (1991) work already mentioned above.

A second implication of these theories of motivation is that of how a pupil's disposition can cause a change in learning habits over a period. There is an extensive literature that describes one of the main goals of schools as being the creation of lifelong learners (Claxton and Lucas, 2009). The objective should be to develop pupils who, having completed a task, select a second one that is a more challenging task than the previous one. By selecting increasing challenges, the pupil maintains their interest, and their learning continues (Renninger, Hidi, and Krapp, 1992). If these pupils fail on a task, instead of their ego suffering a knock, they should be encouraged to select another task which is slightly less difficult than that in which they 'failed'. By inculcating such values in pupils, we are more likely to produce students who will go on to be lifelong learners.

Teachers should try to develop in children an attitude towards lifelong learning. Children should be used to challenge so that they see challenge as part of the learning process. Learners should not see the main goal of education to 'show how smart they are', but to seek challenge by being metacognitive. They should be aware of not only how they learn, but also what their next challenge should be. Pupils should develop a mastery-oriented response to tasks, and understand that intelligence is an 'incremental' phenomenon, not a fixed entity. Children are more likely to be motivated if they love

challenge and know how they learn. They will learn more effectively if they are metacognitive, the subject of the next section.

## 2.6 Metacognition

Metacognition has been defined as 'knowledge or awareness of cognitive processes and the ability to use self-regulatory mechanisms to control these processes (Eggen and Kauchak, 1997). There are two aspects of metacognition: 1) reflection- thinking about what we know; and 2) self-regulation- that means, managing how we go about learning (Schunk, 2008). When these two aspects are combined, they make up an important aspect of learning and development. When children develop these abilities, learners do not only become more reflective about their learning, but they also acquire and develop their learning strategies (Schunk, 2008).

Metacognition is important to learning, people who are metacognitive outperform those who are not. Swanson (1990) found that individuals with a 'high level of metacognitive processing out performed those with lower metacognitive processing' on problem-solving activities regardless of their overall general aptitude level. It involves self-regulation and reflection in learning, when a child becomes metacognitive, they are involved in the learning process:

> Metacognition is especially important because it affects acquisition, comprehension, retention and application of what is learned, in addition to affecting learning efficiency, critical thinking and problem solving. Metacognitive awareness enables control or self-regulation over thinking and learning processes and products. (Hartman, 2001:1)

Metacognitive strategies are usually presented in the literature as a concept that is different from cognition. Flavell (1979) however acknowledged that metacognitive knowledge may not be that different from cognitive knowledge. The difference between metacognitive and cognitive knowledge might lie in how information is used. Metacognition is 'knowledge and awareness of one's own cognitive processes' (Mayer, 2003: 100). If an individual wants to achieve a certain goal, it is cognitive strategies that are used. Metacognition usually follows, though might also precede a cognitive activity. An awareness of a lack of understanding within the individual's mind activates the

metacognitive processes as the learner seeks to come to an understanding (Roberts and Erdos, 1993).

Metacognition reflects the learning of an individual, but also the self-regulation of the learner (Flavell 1979). The learner must be actively engaged in the learning process if they are going to develop metacognitive abilities. Swanson (1990) was able to demonstrate a direct relationship between cognition and metacognition. He found that those with higher levels of metacognitive processing skills did better than those with lower metacognitive skills in problem solving activities. Lucangeli *et al.* (1994) conducted research on the reading skills of students, they found that poor readers have poorer metacognitive skills and abilities. Pupils who have well developed metacognitive skills, however, are skilled in more than one area of the curriculum and can transfer these skills as shown by Larkin, (2002:66). 'Other research shows that people with higher metacognitive skills are also more adept at transferring skills from one domain to another'. Metacognition cannot be seen in isolation from other factors of a student's attitude and ability, such as ability, personality and motivation:

> A teacher's understanding of metacognition will probably be most useful if it is complemented by an understanding of these other aspects of students' functioning and of how they interact with metacognition. (Sternberg, 1998:128)

Metacognition is likely to occur in situations that stimulate careful and highly conscious thinking. For example, where a task requires a lot of planning because it is new, and when decisions are weighty and risky; and when the cognitive task is difficult, and where attention and memory are not distracted:

> Before they learn metacognitive strategies, children do not use tactics like planning their work or monitoring their own problem solving. They do not realize that they can use strategies and short-cuts to help them solve problems. This is not to say that young children do not have metacognitive capabilities (Darling-Hammond et al, 2013: 159).

The process of metacognition leaves the student with the feeling of being puzzled and that they are a long way from solving the problem. Memory is important to the development of metacognition. However, the problem might be solved more easily if

the student remembers a similar problem that had been successfully solved in the past. As well as memory, self-regulation is also important to the concept of metacognition.

As students set themselves challenging goals, they can see their learning process more easily which makes them improve their goal setting and to become more adventurous in doing so. There is a reciprocal relationship between how pupils perceive their efficiency and their goal setting (Schunk, 1990). Students set themselves more challenging goals as their self- efficacy increases, as they become more proficient as learners, they also become more committed to fulfilling their challenges and goals. Metacognition, like motivation, is enhanced by the setting of goals. The areas of study, overlap and it is clear that one cannot be accomplished without the other. Motivated pupils are more likely to become metacognitive, and metacognitive pupils are more likely to become motivated.

I deduce that there are several ways in which metacognition can be developed in schools. The following is not intended as a list of all of the possible strategies but as suggestions. One method is to teach pupils that their ability can change. They can be taught to set goals and to evaluate them at the end of a session. The use of success criteria that break the learning objective of a lesson down into manageable parts helps children to see where they 'got stuck'. Pupils in schools could be given opportunities to monitor and adapt their learning. Questions could be used to focus the attention of pupils upon the key points of the learning. Pupils could also be given opportunities to retell, when doing this, they could summarise what they have read or heard.

The task of the educator is to create the most appropriate environment in which pupils can develop self-awareness and motivation. In so doing, pupils will become more able to learn and to understand the ways in which they learn and to visualise how they might move forward in their learning. Central to learning in children in this study is the role of the imagination, in this study they were required to imagine themselves in a number of roles.

## 2.7 Imagination

The present study required children to detach themselves from the reality of their surroundings and to immerse themselves into a fictitious world. In this fictitious world, they imagined themselves as spies, generals, police investigators and similar roles that, as a consequence, incorporated the mantle of the expert.

Imagination plays an important role in the 'narrative concern' (Sutton-Smith, 1988:22). People understand the world around them and make sense of new experiences through narratives. Sutton-Smith argued that people are better able to make sense of narratives than they are lists of events or items. The imagination is important to education; it plays an important part in the learning process. The use of imagination in schools is the antithesis of the commonly held view. The view is commonly held that the human mind is like a computer, able to store information in an almost digital format; this is discussed further in chapter seven. Egan (1992) argued that, 'This has been going on so long and so ubiquitously in schools that the meaning of learning that is most common is this kind of mechanical storage and retrieval' (Egan, 1992: 50).

Egan pointed out however that when we learn things are mixed up in the mind. When learning, new connections are made; new bits added to the overall framework of what is held within. When learning in this less than computerised way, things do not necessarily emerge from the mind in the same form as which they were stored. Imagination is an important part of the process that shapes the information and reformats it. Egan argued that 'only knowledge in our memories is accessible to the action of the imagination', (Egan, 1992:52). When teaching ignores the imagination; students will fail to understand their experience, learning needs imagination to make it meaningful.

There are several narrative capacities within the mind: the use of metaphor, the sense of understanding through making the meaning of something, and the imagination. The development of these capacities is so important because their importance to our general ability to make meaning out of everyday experiences. 'We dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticise, gossip, learn, hate and live by narrative' (Hardy, 1968: 5).

It could be argued that all teaching should strive to develop the 'narrative concern'. All aspects of life and what it is to be human involve narrative, as such the ability to tell, imagine, invent or retell events and other aspects of daily life as a story are essential. Not only is imagination essential to story writing, but also the ability to tell a story is essential to imagine. Perhaps the imagination does involve not only imagery, but also narrative, something not mentioned by Nigel in his critique of White (Nigel 1997:95-127). White is a philosopher who argued that there was only one meaning of the word imagine. White argued that to imagine something is 'to think of [something] as possibly being so (White, 1990: 184). The present study attempted to create imaginative work that was intended to stimulate the imaginations of the children, but an equally important aspect was that of recording their emotions, feelings and experiences in the form of stories. This involved discussion within groups and the planning of stories using brainstorming and mind maps.'Cognitive activity' that lacks imagination, or an affective component is 'desiccated and inadequate', learning with imagination makes the process more pleasurable:

> A common observation about imaginatively engaged learning is that it gives pleasure. Comenius long ago argued that if we arranged learning properly children would come to school with as much joy as they go to the fair. (Egan, 1992:51)

Imagination was an important aspect of this study, the ability of children to transcend their surroundings was essential to the aims of improving their writing. The children were required to 'imagine that', and as such used their imaginations in the sense of the impression idea relation, but they were also required to set experiences and images to memory. These memories could then be used later, following group discussions to improve their writing by including their experiences and sensations as they carried out the various tasks set. There was a third sense in which they used their imaginations in terms of problem-solving such as how to find evidence that would help piece together the information necessary to solve the murder mystery. In being a detective, they were playing the role of an expert, which brings me to the pedagogic practices and the Mantle of the Expert.

# PEDOGOGIC PRACTICES

Paedagogic practices form the third section of this chapter they relate to the third strand of the research, the kinaesthetic strand. This aspect of the teaching and learning was performed through Mantle of the Expert.

## 2.8 Mantle of the Expert

'Mantle of the Expert' (MoE) is a system of drama developed by Dorothy Heathcote. Heathcote developed MoE as a response to her 'despair at not being able to find ways in the classroom to make work feel real for society in action' (Heathcote, 1984:192). I used MoE in a wider context than Heathcote had, I used it in literacy, in story writing, I did not restrict it to drama. The idea behind the system is that: 'a person will wear the mantle of their responsibility so that all may see it and recognise it, and learn the skills which make it possible for them to be given the gift label 'expert'' (Heathcote, 1984:192). The system enabled Heathcote to create a context for school work, and afforded a structure for authentic learning. Drama she argued has a 'gift' in that, it offers opportunities for micro-societies, micro skills, and micro behaviours.

A template for the use of Mantle of the Expert in the classroom was given in a study by Heathcote (Wagner, 1985:167). A group of 18 pupils worked on King Arthur and were required to become contemporary monks who had discovered a mediaeval scroll from the fifth century AD. The work was ten sessions long and divided into five days; it required pupils to carry out every day monastic duties, tending the hives, re-thatching, taking the bull to pasture and other such duties. The five days were divided into ten parts, which began with, what they knew of King Arthur. They then continued by making maps, drawing pictures of the abbey, making cider as monks did at the time, and similar activities.

The activity incorporated skills that are typical of drama, but also collecting data, finding place names and making choices about activities related to being a monk. Throughout these first five sessions, awareness of senses was increasingly stimulated, and in the third session, the children were required to pronounce the place names appropriately. The next task became more exacting still; they were required to give

accounts of their day to day activities. Heathcote suggested a list of ten headings to 'stimulate formal language' (Heathcote), also to help participants reflect on their experiences and to organise sections of their accounts. The greatest pressure came when participants were required to give an account of their activities in the ninth session. The final act was revising. Revision began orally by revising place names on the map, but pupils were also required to revise their written accounts. The participants began to realise the importance of a written record by the time of the seventh episode. Heathcote introduced a special script, and an adult to act in the role of chief scribe to support their work and underline the importance of writing.

Heathcote used questioning to direct the class but valued the contribution of the children, insisting that it was important to obtain the agreement of all of the participants involved in the sessions. The children were not used to making decisions in front of the teacher, but they were pressed for their contributions nonetheless. In the fourth episode, one girl suggested that they should include a guest house; this was repeated by Heathcote so that everyone could hear. 'Someone suggested that we should have a guest house for the tourists. Did you want a guest house?' (Wagner, 1985:169). The discussion then turned to what sort of guest house and what sort of tourists or guests to permit, constantly driving to force a group decision on each point. By forcing a group decision, Heathcote optimised the opportunity for 'ownership' of the activity by the children involved. Questions were also used to direct the pupils and to keep the children 'in role.' When deciding the place names on the topographical map, one child suggested the river Winding. Heathcote pointed out that local people tended to shorten names, so the river Winding was shortened to the River Wynde, in keeping with the mediaeval spelling and to nudge the children back into the fifth century.

The image of the monastic land was clarified in episode two, when children were required to create the land using their hands to stretch a piece of green silk on the floor. They used wads of newspaper to form the topography. They viewed this from a bird's eye perspective, and then used it to create a map of the monastery and its environs. In episode seven the children were pushed for an even more precise private image, each chose a task that was vital to the monastery.

An important aspect of Mantle of the Expert is experiencing before writing. The pupils did not write until they had experienced all aspects of monastic life. They need to have explored the lives of the monks and the action is slowed down to focus on one particular aspect of the study. The same principle was used in this study, children did not write until they had acted out a role for several days, the importance of kinaesthetic acting is supported by Wagner:

> No teaching strategy paid off more obviously in the quality of the children's accounts than the slowing down of the action, and the pressure to visualise and kinaesthetically realise each action, slowly pantomiming their work in the air around them. (Wagner, 1985:169)

The depth of involvement of the children is shown by one reference to the discovery of the sacred script:

> We slowly opened it (the box in which the manuscript was hidden) and found a bundle the size of a new born baby. (Wagner, 1985:169)

The use of the word 'baby' came from the clarity of the image in their minds, and the use of the words 'new born baby' evoked the gentleness with which the monks reverently handled the sacred object that they had found.

Mantle of the Expert can encourage children to transform their words into written form; it helps them to develop a language to match the drama of their experience. They began to see their accounts become part of a permanent record. Their choices of what to say changed until they were: 'guided by their awareness of their audience and purpose' (Odell 1981:100). Pupils had experienced the work before they were asked to write anything down. By having the experience, pupils avoided writer's block, and their writing was richer in terms of the use of their senses and how they felt first hand:

> To insist that students write before they have accessed what they know or have collected some material is to court disaster. (Wagner 1985:167)

In the example above, pupils did not begin to write until the fourth or fifth day, by which time they had begun to understand the daily pattern of a monk's life. Through the

drama, participants had contemplated the picking of apples, and what it meant to live as part of a religious order where the quality of their work mattered. The drama also enabled them to 'experience' a life of living according to vows and the needs of others, and these aspects were visible in their writing. Wagner offers an example of a child's writing that demonstrates the depth of understanding:

> I was picking apples in the orchard and I heard a bull whining very loudly. So I started climbing up the hill while looking through my binoculars, and I saw something brown caught in the tree. I studied it carefully and noticed that it was making lots of noise. The first thing I remembered was that I still had a knife in my hand from cutting apples at the cider press I used the knife to cut some branches Wagner. (1985:168)

This connectivity in the writing comes from the experience of the children having 'lived' the role of a medieval monk for the past five days. By using Mantle of the Expert, children's writing can be enriched in terms of its quality and detail.

Exactly what Mantle of the Expert is, can be further understood by reading Bolton (1995) who attempts to use this drama framework to overcome a problem of bullying in a school in which he taught. What he thought was a fairly successful session, on tackling the problem, had flaws in terms of the MoE procedure. In a one-hour lesson, he set out to address the issues of children who teased others for having the 'wrong clothes', different name or strange accent. He sent an outline of the lesson to Heathcote, and the conversation between Heathcote and Bolton is outlined in their book (Heathcote and Bolton 1995:15-23). To summarise the discussion, Heathcote explained that a single session was not Mantle of the Expert. To try to address such an issue as bullying in one hour was not to 'make' the children into experts, but merely to give them the label 'expert'. A list of seven features is required for work to become Mantle of the Expert; this list is taken from (Heathcote and Bolton 1995:23-24):

- The first is an agreement between students and the teacher that the teacher will take on a functional role, rather than becoming a character in the play.

- That the subject matter is explored in a series of short-term tasks, with a feeling of caring for what they are doing, and the values they stand for are not simulated.

- The teacher usually initiates the tasks, and the pupils are in small groups, which often come together to make decisions.

- It is the teacher who devises the task and assesses the degree of skill, learning, and knowledge type.

- Each task is selected carefully and steps up in a series of tasks that are graded.

- The teacher's main role is that he/she is a source of guidance.

- The teacher's role is one of raising student's awareness about the task.

Guidelines need to be followed by the teacher when setting up a Mantle of the Expert activity. The guidelines include how the work is to be presented, fiction; the 'dynamic of action' (Heathcote and Bolton, 1995); and a history as well as an implied future. 'Great care must be taken in presenting the topic effectively' (Heathcote and Bolton, 1995:25). This could often be achieved through teacher talk accompanied by an image, such as a picture, diagram or map, or a combination of these. It should also avoid an instructional component and use an appropriate linguistic style that allows entry into the effective framework.

The idea of fiction must be introduced early through the use of the word 'if'; without this premise, children might think that they will be required to do the actual work. The choice of approach is determined by the nature of the class, for example:

> a reluctant, turned off class would possibly do best if the leader indicated in some way that our enterprise has a beat-the-boss angle. (Heathcote and Bolton, 1995:26)

The purpose of the teacher talk in the introduction would be to 'raise the curtain', where the class would be invited to peep at a metaphorical stage where fiction could take place.

The 'Dynamic of Action' is an important aspect of Mantle of the Expert, by this I mean an issue is approached in a subtly different way and from a different starting point. Heathcote and Bolton (1995) discussed a drama about an ambulance strike that was in the news at the time, and in particular they wanted to focus on the role of the conciliation services:

> Of course, most teachers doing a drama about a strike would immediately cast the students as ambulance personnel and bosses and go for dramatic conflict! Mantle of the Expert does not work in this way; it works obliquely- learning about one thing by looking through something else. In this case, the students will learn about ambulance workers by looking through the process of mediation. (Heathcote and Bolton 1995:27)

The function of mediators must be made clear from the start, it is not necessary to label the children at this stage because the name is less important than the power to function. In the case of the monks mentioned in the study by Heathcote above, it was not necessary to label them monks from the start, what is more important is the power to operate. To begin work as mediators, the power to operate is afforded through examples of letters from both sides, stating that both sides wish to meet separately. In the drama that followed, children grew into roles, be it as ambulance staff, those in charge of pay settlements or arbitrators.

Heathcote did not believe that education nor art were about subjectivity, nor did she automatically offer children the right to 'express themselves'. Heathcote believed that self-expression was a right that had to be earned, not automatically given. When children are put in the position of being experts, there is the need to change the system of communication. The teacher cannot give direction and information to children who have been placed in the position of experts. On the other hand, the children are 'playing the role' of experts and do not yet have the necessary expertise. Planning must be carefully designed and planned so that the teacher can protect the children from the 'harmful' effects of their ignorance. The group develops expertise through applying their imaginations to whichever social timeframe is under study. The interaction within the group is verbal, or through the use of signs or symbols, and helps to construct a group image and socially constructed knowledge. The method of imaginative symbolic construction functions and is sustained by the nature of the problem-solving tasks. One of the key processes here is metacognition; children develop self-awareness through the drama of Mantle of the Expert.

MoE is, of course, an example of role playing, which has disadvantages, as well as advantages. One of the main advantages is that of motivation, through this form of learning, pupils have 'a heightened interest and excitement in learning' (Cohen *et al.*,

2007: 455). Other advantages are that there is a sustained level of freshness and novelty, a transformation of the traditional pupil-teacher relationship including the power relationship that goes hand in hand with it.

Despite the obvious advantages of the MoE method, there are of course disadvantages. The first and most obvious disadvantage is that simulation involves imitating the real world, and it must be remembered that it is not the real world. This in itself might be difficult for some pupils, such as those with Autism or Aspergers, how easy is it for children such as these to slip into and out of imaginary and the real world? Some children without clearly defined conditions might also find it difficult to make believe and access this form of learning. There are other potential issues with the method such as restraints on time and resources. 'Simulations, however interesting and attractive, are time-demanding activities and ought therefore to justify fully the restricted timetabling allotted to competing educational approaches' (Cohen *et al.*, 2007: 455). Simulation materials may present problems in terms of being readily accepted as a learning method by groups such as parent associations. They might also be costly, difficult to fund or difficult to organise and arrange in a school setting.

MoE was one aspect of a kinaesthetic method used in this study; it complemented the introduction of Pupil Voice and it allowed children to play. Through the use of these strategies, children became more motivated to learn, and their writing improved because they were able to use their imaginations through play. As a result of being actively involved in their learning they became more aware of themselves and through the activities, the way in which they learned, so developing their metacognitive awareness. This study took place within a constructivist paradigm; the children constructed knowledge themselves within a social setting and developed skills such as writing, communication and co-operation.

## 2.9 Summary

This chapter discussed some of the elements that were involved in the research. It explored some of the key concepts such as MoE, imagination and play that were central to the teaching method used when we were writing stories. Although this study looked at the effect of kinaesthetic teaching on story writing, it would be impossible to study

the effect of just one factor such as kinaesthetic teaching upon one phenomenon such as story writing. There are a number of issues and initiatives that must also be considered, all learning is context-dependent. Chapter three will discuss some of the aspects of education policy that made an impact on this work.

# CHAPTER 3
# CONTEXTUALISING THE LEARNING
## 3.1a Introduction

This chapter sets the scene for contextualising the initiatives and movements that have had a major impact on education and this research. There are three main sections: the first gives a brief historical overview of the development of State education in Britain and then evaluates the National Curriculum and the SATs (Statutory Attainment Tests). The second section discusses testing, which was used in this research to assess the amount of improvement made by children. The third section discusses the work of Howard Gardner and VAK in more detail and the views and arguments of those opposed to the theories of Multiple Intelligences and VAK.

## 3.1b State involvement in education and the National Curriculum

The Factory Act of 1833 introduced the requirement that all children between the ages of nine and thirteen should receive at least two hours of schooling per day. This was motivated not by some ideal to educate, rather by a desire to stop the exploitation of children in factories. The British state first became more directly involved in education in 1870: before that time, 'state involvement in elementary education was slight' (Arthur and Davies, 2010: 32). Though children received an education, the quality of it was low. The government was hostile to extensive state involvement in education. Hostility to intervention was 'because it believed educating the poor would lead them to feel discontent with their lot and hence to unrest and rebellion' (Arthur and Davies, 2010: 32). Britain lagged behind other countries in the establishment of an education system, especially Prussia, France and the USA, where the quality of teaching was considered to be far higher than in England, Wales and Scotland. The Elementary Education Act of 1870 marked the first time that the British state became an education provider. The Act did not introduce compulsory schooling but was more concerned with the building and staffing of new schools, and soon afterwards, voluntary societies and churches began to establish their schools. An act was passed in Scotland, simply called the 'Education Act', in 1872 which did make primary schooling compulsory. The Balfour Act of 1902 tied education to the local education authority, replacing school boards, and in so doing, education became linked to the state:

In essence, the Acts of 1870, 1872 and 1902 laid the foundation for the national system of primary education which remains in Britain today'. (Arthur and Davies, 2010: 33)

The engagement of the state changed over the years, from an interest in the organisation and funding to matters of what is taught, and performance. What was to be taught was dictated by the National Curriculum, which was introduced in the Education Act of 1988. The act 'represents a statutory code for the subjects to be taught in state schools' (Arthur and Davies, 2010: 33). It reduced the autonomy of the individual teacher and introduced a statutory code for the subjects to be taught in state schools. A particular concern in primary education from that time and which is still in the headlines of national newspapers has been the '3Rs' (reading, writing and arithmetic). This emphasis was the result of a backlash from Conservatives in Government against lax standards and the progressive teaching methods of the 1960's, which did not put an emphasis upon the teaching of formal grammar. The emphasis on the '3Rs' ignores the three strands that are central to this study, the kinaesthetic, social and cognitive strands.

The government announced its intention to introduce a National Curriculum (NC) in January 1987 for all students of compulsory school age in England and Wales. The curriculum would include areas defined as the 'foundation' subjects that would have to be taught to all pupils of compulsory school age (five to 16 years of age). Each subject in the curriculum would be arranged into a set of attainment targets and programmes of study. The purpose of the attainment targets was to: establish what children should be expected to be able to do at various ages. The attainment targets would also enable the progress of each child to be measured against national standards. It was hoped that the range of attainment targets would cater for a range of abilities and be sufficiently challenging at all levels to raise expectations. It was hoped that the taregts would focus on children of middle achievement, who were frequently not challenged enough.

Alongside the attainment targets, programmes of study would be specified for each subject which would:

> …reflect the attainment targets, and set out the overall content, knowledge, skills and processes relevant to today's needs that pupils should be taught in order to achieve them. They should also specify in more detail a minimum of common content, which all pupils should be taught, and set out any areas of learning in other subjects or themes that should be covered in each stage. (Dept of Education and Science, 1987: 10)

The NC started with seemingly high ideals, with the interests of the children and what they should learn as its *raison d'être*. The National Curriculum has now been established for many years, but it has undergone almost constant change from its conception. There has been a debate over the years about the need for a National Curriculum. The debate however, is not now about the need for it, but rather about what the 'content' (for example, which subjects, and which knowledge taught) should be:

> Debate is no longer about the principle of the National Curriculum, but about the detail... it is about how the subjects should be developed within the National Curriculum and about the crucial testing arrangements associated with them; it is not about whether subjects should form part of the National Curriculum. (DfEE 1992: 3)

It can be deduced from this statement that the National Curriculum is extremely politicised, as the main parties have modified it and adapted it to their needs and beliefs. Education has come a long way from those early days when the state was not involved. There have been other initiatives in the establishment and evolution of the National Curriculum, notably the introduction of the National Literacy (NLS) and National Numeracy (NNS) Strategies. These strategies were the result of the almost constant attempt to push up standards. The NLS and NNS were separate initiatives, but ones that had the same key purpose of raising standards in the subject areas of literacy and mathematics. Along with the initiatives came targets, introduced by the new Labour government in 1998. David Blunkett, then secretary of state for Education set the target of the proportion of pupils to reach level 4 by the end of Key Stage Two. The target was to be 80% in mathematics and 75% in English (also called literacy). The National Curriculum was now firmly in the hands and control of the politicians:

> The movement to increase State control of schools had progressed from the introduction of the National Curriculum by the Thatcher Government in 1987, which set a trend for educational reforms without prior research or evaluation,

to New Labour's introduction of the NNS and NLS. Both Strategies prescribe the pedagogy to be employed in schools by teachers, hence a state pedagogy. (Kassem *et al.*, 2006: 33)

The National Curriculum was not presented as a government directive, schools were told that they should use the National Curriculum 'unless the school can demonstrate through its literacy action plan, schemes of work and performance in Key Stage Two tests, that the approach it has adopted is at least as effective' (Literacy Task Force 1997: 5). This statement, in effect, dictated that the teaching methods outlined in the NLS and NNS (that followed a year later) would be followed:

> Few schools or teachers of literacy, given the threat of inspection and publicised results, would have the confidence to predominantly use other teaching methods. (Kassem *et al.*, 2006: 33)

In an ideal world, teachers would be left to teach, it would be teachers who determined the content of the curriculum and those who determined teaching methods. Aspects of teaching such as the progressive methods of the 1960's, holistic teaching and 'topic' based learning have all been phased out by the introduction of the National Curriculum. Writers on educational theory almost unanimously hold that it should be left to teachers to determine the pedagogy:

> The pedagogy of teaching in schools is related to ways of improving student learning and organising classrooms and school for instruction. (Altrichter and Elliott, 2000: 147)

Implicit in the writing of Kyriacou is the notion that one teaching style cannot be used to teach a class:

> it needs to be stated at the outset that the complexities involved in teaching are such that effective teaching cannot be reduced simply to requiring teachers to mechanistically adopt a set of practices that will successfully enable all pupils to learn to the best of their ability. (Kyriacou, 2010: 166)

When outlining the complexity of teaching as a practice, Kyriacou included some of the variables that a teacher should consider when teaching, much of which was omitted by the NLS and NNS. Effective teaching requires teachers to adapt what they teach to

what the children need to learn. These teaching methods will need to be adapted to different children. Children do not all learn in the same way.

Others have argued that a pedagogy directed, controlled and determined by central government acts against the spontaneity of lessons and education and rules out the unexpected:

> The best moments of learning often come at unexpected times, outside the bureaucratic, predictable and standardised regime in which far too many schools feel they are working. (Arthur and Davies, 2010: 159)

The full impact of a political agenda in education is perhaps best summarised by MacDonald in his article 'How education became nobody's business.' He argued that the political manifesto of 1987 which heralded the Education Act of 1988 introduced major changes to schools, in terms of management, status and content of state schools. Finance was devolved to individual schools from the Local Education Authorities (LEAs), with schools having the ability through parent power to vote themselves out of the control of LEA's. Amongst these arrangements was the Trojan horse of the National Curriculum, which was, 'prescribed in detail, and compulsory for all schools, supplanted the long-standing tradition of professional judgement' (MacDonald, 2000: 21). The full impact is then described:

> A system of attainment targets and test-based performance measures was introduced, the results to be published for each school in its locality as an aid to consumer choice in the new, internal market. (MacDonald, 2000: 21)

Not only were schools and LEA's affected, even the schools inspectorate was all but disbanded. The function of the independent schools inspectorate was replaced and taken over by the new 'ad hoc inspectorate. The Inspectorate were chosen from a centrally approved list and paid daily rates to carry out periodic evaluations of individual school compliance and performance' (MacDonald, 2000: 21). Schools could then be identified as failing, shamed and closed, the Secretary of State assumed unprecedented powers under the Act. The National Curriculum, which could have offered so much, returned education to the values of the 1950s:

> The new National Curriculum, to the horror of the education establishment, which had at least expected a strong vocational element, turned out to be a fundamentalist restoration of the traditional grammar school syllabus. In essence, it could have been borrowed from the archives of the Victoria and Albert Museum. (MacDonald, 2000: 22)

The National Curriculum of 1989 was designed around perhaps the most conservative of the four main curricular models, and the most traditional, and to some, the most outdated. Curtis and Pettigrew (2010: 37-38), outline the four curriculum models, they are:

• Curriculum as transmission, which is education as acquiring knowledge, questions of the curriculum are about content, which knowledge is the most important? There is a clear hierarchy between teachers and students: teachers possess the knowledge, students do not.

• Curriculum as product, which is a shift of emphasis from questions of content to questions concerning the sorts of student that the curriculum might produce. The student is no longer the main focus; rather it is the end product, the content and structure of the curriculum are developed to achieve that end. Subject knowledge is not important in its right but only in terms of how it enables the individual to become a useful worker or citizen. A common argument against this model is that teachers become 'technicians' told what to do, but with limited opportunity for imagination or creativity.

• Curriculum as process is where the learners are treated as individuals who interact with teachers, free to make their interpretations, and able to contribute to their learning, knowledge and understanding. This model emphasises strategies of teaching and learning, skills, behaviour and attitudes of students are less important.the most important aspects of education are, surprise; creativity and innovation. This model is more difficult to measure (or test) than the other two. It places more emphasis on the individual teacher. As, high-quality teacher training, support and continued professional development are necessary.

• Curriculum as praxis is more concerned with the relationship between theory and practice; knowledge is tentative and open to critique. 'Taken for granted'

knowledge should be challenged as the voice of the powerful and for this reason as the source of oppression (Curtis and Pettigrew, 2010: 37-38). In this model, a curriculum is only worthwhile where it has direct relevance to the real lives and experiences of the learners. The aim of this model is to raise critical consciousness and create informed, committed action as the foundation for hope in the future. A major argument against this model is that it would have the potential danger of producing partial learners with an overly critical standpoint of the world (Curtis and Pettigrew, 2010: 37-38).

The first two models are those which are most often used in curricular design; the fourth would be potentially extremely radical. The third model was the design most closely used in the current research, but it is a model that was not explored in the development of the National Curriculum. In an age where creativity, innovation and original thought is needed to compete on a worldwide stage, the curriculum should be designed to develop just those qualities.

Howe and Davies (2013: 160) have criticised the first model, because it becomes linear (headed in one direction). It was also criticised because it is instrumental (it achieves the aim of the curriculum without valuing the journey). It also leads to 'a loss of freedom for the pupil and teacher' (Howe and Davies, 2013: 160). A curriculum in which the transmission of knowledge is the primary focus raises a number of questions. Amongst those questions are: who selects the knowledge? What is the status of the knowledge and if the transmission is from the head of the teacher to the learner, what are the faults that might occur in its transmission? The second model suffers from similar problems because the place of work requires qualifications, and they require knowledge and testing.

In chapter one I briefly discussed two views of the human mind; the first is that it is like a computer in which information is processed, coded, inscribed, sorted collected and retrieved. The second view of the nature of the human mind is that it is formed by and realised in the use of human culture. The extension of this argument that the mind cannot exist without culture will be discussed further in chapter seven. The first view of the human mind as a form of computer would fit best with the first or second model of the curriculum above (Curtis and Pettigrew, 2010: 37-38). The second view of the mind, as formed by culture, would best fit the third model of the curriculum in which learners

are treated as individuals who interact and in which the emphasis is upon the teacher. Howe and Davies (2013) outline the benefits of the curriculum as process for the advancement of the rights of the learner and the development of social relationships. This model has been criticised 'on the grounds that it neither helps to define a standard content for all learners (model 1). Nor does it equip them with the skills needed for employment (model 2)' (Howe and Davies, 2013: 161).

The concept of a National Curriculum has potential benefits. If followed all children would arguably have the same chance and society would approach a meritocracy. Public schools however are and presumably would continue to be exempt from following the NC. A National Curriculum could be seen as the logical extension of the comprehensive school programme established after world war two. Some of the potential benefits are to do with entitlement, ensuring that pupils are not disenfranchised by teachers who wish to teach their agenda:

> It (the National Curriculum) has the potential to create an entitlement to learning, giving to pupils and parents a clear agenda for the eleven years of compulsory schooling and beyond. It can also provide a yardstick against which educational inequality can be judged and remedied. (Moon, 2010: 157)

A National Curriculum could also enable collaboration by teachers to bring about improvements and changes, working within the framework of it. Examples of collaboration could be those such as the Records of Achievement Projects and Technical and Vocational Educational Initiative (TVEI), it could also help the planning of lessons. Materials collected could be used as a central resource to be 'dipped into' at either a school, regional or national level. A National Curriculum has the potential if sensitively planned to become enveloped with a sense of the public ownership of education. It also has the potential to:

> raise the status of teaching and schooling, and provide sound criteria against which issues of accountability, effectiveness and improvement could be judged. (Moon, 2010:157)

As well as public ownership, the curriculum could be enhanced and made 'more fit for purpose' if it were not based on either the transmission or the product model. It would be better if it were instead redeveloped with the children at the centre, on the process

model. This would allow children and teachers to interact, for the teacher to be questioned. Teaching and learning would be central, and it would allow a greater degree of creativity. The national curriculum does not highlight the importance of the three strands in this research, a curriculum should address kinaesthetic teaching, cognition and the role of social aspects of education. The next section explores the use of testing in schools it evaluates both the potential benefits and problems of testing.

## 3.2 The use of testing in schools

Whether one likes tests or not, they are part of teaching. Testing was used in this work to determine the amount of improvement the children had made over the course of a year's study. The children were baseline tested at the start of the academic year in September. They were then tested again at the end of the year: the difference between the two performances was taken as the amount a child had improved over the course of the year. The act of testing raises a number of questions: it is not a neutral activity; it does have implications for those tested. It could affect their confidence, or affect the way in which they view themselves as learners or their standing in the class.

The National Standard Assessment Tests (SATs) began in 1990, and right from the beginning they revealed some anomalies:

> The key stage one and three tests revealed that girls outperformed boys, minority ethnic groups generally did less well than white children, and those for whom English is an additional language did less well than others. (Gipps and Murphy, 1994: 205)

The study by Gipps and Murphy (1994) concluded that the tests had been introduced too quickly and the design had been changed. The study also found that not enough attention had been given to the impact of the tests on learners, and not enough attention had been given to equality issues. Despite having been established for over twenty years, the problems with SATs and inequalities persist. In one study of a pilot project called *Aiming high*, the top mathematics set, consisted of 31% of white girls, 24.9% of white boys but only 10.5% of black Caribbean boys. This happened despite the intention of the schools involved in the pilot scheme being to overcome the underachievement of black children.

Data derived from tests have been suspect in another respect. 'Only 2% of black African learners and 4% of black Caribbean learners had been identified as "gifted and talented" under the government's initiative to cater for the most able whereas 10% of white children had been registered' (Gillborn, 2008: 115). The suspicion of racism raised its head when one realised that Indian children outperformed white children in examinations. Despite the fact that Indian children performed so well, the gifted and talented programme registered only 6% of them as being deemed able enough to be on the list.

There is a consistent theme, one in which teachers assume that children who are under-performing will always underperform, in other words if they are not clever now they never will be! Teachers use cognitive ability tests (CATs) and predictive software which assume a certain level of progress over the coming years, and which predict future performance and learning. While such tests only show present performance this is labelled 'ability' in mathematics and literacy, and it is then used to assume that this is fixed in some way. It is assumed that low achievers at key stage two will be low achievers at key stage four, in effect, those children are being 'written off.' Labelling can then become self-image, and the children themselves begin to see themselves as 'thick' or non-academic.

The questions that must be asked are these: is testing necessary?

Could schools exist without it? There are those who would argue for and against:

> Well-constructed standardised tests can help us assess how well students achieve broad, commonly valued academic goals. By evaluating the test performance of groups of students at the same grade level or who have taken the same course, and comparing it with a representative range of students from that group, it is possible to determine how well schools are fostering academic achievement. (Walberg, 2011: 9)

The tests could then be used in a variety of ways, not only to assess which students are the 'highest achievers' and those 'most able' in a subject. The tests can also be used to compare students in one school, town or even country with those in another:

> Standardised tests can measure the degree to which students attain proficiency standards for specific topics and grade levels set by state and national

governments. Standardized tests also make it possible to compare students in one school system, city, state, or country to those in others systems and places, which can reveal insights on what kinds of educational practices work best and which workforce is best prepared to compete in the global economy. (Walberg, 2011: 9)

The Telegraph reported in its article 'Too much testing harms primary school pupils' in October 2013 (one of many articles in 2013 claiming that testing was damaging to children's education):

> The repeated testing of young children is seriously undermining their education, a major study reports. Hours spent drilling pupil's increases "anxiety and stress", narrows the curriculum and has limited impact on standards, it is claimed. Children aged 11 spend almost three weeks practising and sitting tests in their final year of primary school in England while teachers waste five weeks preparing examinations. (Paton: 2013)

The findings were part of a two-year inquiry led by Cambridge University into the state of English primary schools. It found that teachers placed too much emphasis on test scores for fear of the results of a poor set of SATs results:

> In one report, Prof Wynne Harlen, of Bristol University, said the consequences of children not hitting national targets "can be severe", with schools being placed in special measures or even closed. (Paton: 2013)

The impact of the tests can be dramatic, and even determine the curriculum, things that cannot be tested, or that don't count towards the SATs can be omitted:

> As a result, "teachers place emphasis on making sure that pupils' test results are maximised." To pass tests, lessons are often restricted to a narrow memorising of facts which excludes things that cannot be easily marked 'correct or incorrect'. (Paton, 2013)

The problem is, however, that when testing, some children fail, depending upon how the tests have been set up and organised. How do those children respond to such failure? Often they are disenfranchised and react badly, and lose interest in school a certain subject or faith in themselves and their intelligence or ability. When Gillian Shepherd was Secretary of State for Education and Employment (1995-97), she was 'shocked' by the news that half the pupils had turned in below-standard performances. The problem was that, the tests were designed and the 'rules set' by her as Secretary of State:

> After all, they were her tests, commissioned and custom-built to her requirements. There is no independent standard. The first thing that a competent technologist of attainment tests asks of the customer is, 'What percentage do you want to fail? 'Only on that basis can the technologist proceed with confidence to construct the tests and deliver the required result'. (MacDonald, 2000: 23-24)

The arbitrary nature of testing has also been argued by other writers, by the very nature of testing, for it to be of any use; it must have a point fixed between success and failure:

> Students' experiences of assessment play an important role in how they view their schooling and how they perceive themselves as learners. The same assessment system will produce both failures and successes, but assessment is not a neutral process that simply measures success or failure. The particular form of assessment adopted in school plays a part in the active production of success and failure'. (Jerome, 2010: 176)

Concerns about standards in schools are not restricted to the Secretary of State for the United Kingdom (UK), as similar concerns are voiced in other countries including the United states of America (USA):

> By assessing whether individuals are achieving the levels of academic performance needed to participate in the global economy, standardized testing can help us take the necessary measures to restore the nation's international competitiveness. (Walberg, 2011: 12)

To Walberg, testing can be used to measure children's performance, and then inform strategic planning at the government level, whether state or national and the 'necessary measures' can then be taken. Unfortunately, he does not go on to expand what those measures are which could be taken, he then appears to confuse the results of testing with an education:

> A well-educated population is less likely to experience the helplessness felt by those who lack the knowledge and skills needed to participate in the global economy'. (Walberg, 2011: 12)

The assumption is usually that those who perform well on tests and achieve good grades have by virtue of that fact, received a good education. The two do not necessarily go hand in hand, however, the only conclusion that can be derived from children who do

well in tests is that they are good at taking tests. In no way does a good test score reflect upon the overall education. It might be that a group of children that performed well on a test were taught parrot fashion. Another group that did not do as well as the first group might have been taught through a problem-solving approach that developed their social skills, problem-solving skills as well as their ability to co-operate.

When discussing tests, politicians often imply that there is an absolute, objective standard, whereas, in reality, the pass rate can be set anywhere the politician wanted to set it, and it often is. If the political agenda is to 'raise standards,' then the pass mark is often lowered, if the agenda is a return to the 'golden age' of the 1950s, it might be raised. Stobart argued the point:

> When commentators question whether more key stage two learners in England achieving level 4 in their standard assessment tests (SATS) reflects better learning in literacy and numeracy, or merely better 'test taking skills,' this is a question about the validity of SATs. (Stobart, 2006: 135-6)

The point that must be remembered is that performance on SATs tests does not provide an objective measure, it is just one test and might vary on other days and other tests. Some measure of reliability is of course made:

> When an assessment is high in reliability and validity, we might say, in less technical terminology, that it is 'dependable' or 'trustworthy'. (Black and William, 2006: 130)

There are measures that could be taken to increase the accuracy of tests, such as double marking, where each script is marked twice by different markers. By double marking, the test results would be made more reliable, but in doing the second set of marking, the costs would be greatly increased. Instead of evaluating pupils in terms of lengthy handwritten scripts, computer marked multiple choice questions could be used. The problem is however that the range of skills under test would be greatly reduced, as would the level of understanding in the subject, the reliability, however, would be increased.

The USA is a country where the testing regime is as intense as anywhere in the world. Despite the testing regime in the US, in international comparisons (made every three

years), by the Organisation for Economic Co-operation and Development (OECD), the USA lags well behind several other countries. Whatever testing offers, it does not afford success (see Appendix 11). Finland is regularly in the top few countries of those tested and has a very different approach towards testing and education as a whole. The test conducted by the OECD is called the Programme for International Student Assessment (PISA); it compares children of fifteen years of age from a range of countries in Language, Mathematics and Science:

> Finland has ranked at or near the top in all three competencies on every survey since 2000, neck and neck with super achievers such as South Korea and Singapore. In the most recent survey in 2009 Finland slipped slightly, with students in Shanghai, China, taking the best scores, but the Finns are still near the very top. Throughout the same period, the PISA performance of the United States has been middling, at best. (Partanen, 2011)

Finnish schools are unusual because while they compare well to Asian schools such as those in South Korea, Shanghai China, Singapore and Hong Kong, the model of education used is very different. While the Asian schools use long hours of exhaustive cramming and rote memorization, Finnish schools assign less homework and engage children in more creative play. Finland's education system is the antithesis of that of the USA and indeed that of England, Wales and Northern Ireland. There are almost no private schools in Finland, and even the few that do exist cannot charge fees. There is no competition in Finnish schools, no league tables of successful and poorly achieving schools, and perhaps most unexpectedly of all; there are almost no tests. The only exception is what is called the National Matriculation Examination, which everyone takes at the end of a voluntary upper-secondary school, which is approximately the equivalent of American high school. There is clearly another way, we don't have to test: in fact, it might well be the tests themselves that are harmful to the education of children.

There had been debate within government circles about the abolition of the Primary SATs; some had already been abolished, such as the SATs tests for 14-year-olds. The TES reported the announcement by the governement that the SATs tests would continue, partly as the result of the lack of trust on the part of the government of teacher assessment:

> Primary pupils in England will continue to take SATs tests following strong backing from the Westminster Government's expert group on assessment. But the advisers have called for league tables to be replaced by school report cards. The long awaited report recommends the abolition of national Key Stage 2 science tests and moving SATs from the second week in May to the middle of June. But the group concluded that removing all externally-marked tests for 11 year-olds in favour of teacher assessment would 'represent a step backwards, both for pupils' learning and for school accountability'. (Stewart, 2009)

It would appear that there is not the political will to abolish SATs, so if assessment in the form of tests is set to stay, what is the best form of test to give to pupils? The first necessity is that the assessment should be accurate and effective. Tests should be reliable, in other words, if the same type of assessment were to be given again to the same child, the result would be the same:

> An exam is reliable to the extent that the same learner gets the same result, regardless of extraneous circumstances, such as the identity of the marker. This is crucial if learners, parents, schools, employers and government are to have confidence in the outcome of assessment. (Black and William, 2006: 119)

Jerome argued that none of this would be important if the results of the tests were not to be published or used for comparative purposes. The results would be of value if they were instead, used for 'a relatively informal and personal exchange between a learner and a teacher' (Jerome, 2010: 176).

There are different types of tests based upon their purpose; some are designed to be diagnostic, to diagnose certain learning difficulties, for example, dyslexia. The assessment or test might be formative; this would be used to determine where the learner is and use the knowledge to inform the future teaching and learning. Formative assessment is a term used whenever the assessment activity can feed back into learning. The third type of assessment or test is summative, which takes place at the end of a period of learning and is designed to measure the learning that has already taken place. 'These data are used to report on an individual's achievements but are also used to evaluate school/ teacher effectiveness (Black, 2001: 31).

Low self-esteem can result from a poor performance on tests and in overall academic performance. Poor results can confirm the child's self-image as, not being as bright as some of the others:

> Findings revealed that students' level of self-esteem was a significant determinant in their academic achievement. If students develop higher levels of self-esteem, they would exhibit higher academic achievement (Aryana, 2010: 2475).

As well as the problem of self-image, testing has led to a narrowing of the curriculum, with an over-emphasis upon subjects that are tested. Subjects that are untested are almost or entirely absent from the curriculum, such as art drama or even history and geography.

The focus on examinations results in pupils who become focused on performance outcomes rather than learning. A report by the Assessment Reform Group (ARG), found 'regular test practice reinforced test taking strategies rather than deeper learning or higher order thinking' (ARG, 2002: 4). Teachers and teaching unions have claimed over the years that higher standards (in terms of increasing numbers of children who achieve level 4 in the key stage two SATs) were the result of improved teaching. There have been reports that have  brought that assertion into question. Davies (1999:18) and Broadfoot (2007: 33), found that the increasing numbers achieving level 4 in key stage two SATs was a reflection of teacher's improved ability to teach test taking skills rather than teaching a greater depth of understanding of the subject. This distortion of education was echoed by the House of Parliament Committee for Children, Schools and Families when it concluded that:

> A variety of classroom practices aimed at improving test results has distorted the education of some children, which may leave them unprepared for higher education and employment. (Children, Schools and Families Committee, 2008: 3)

The committee also reported that the continued linking of individual learner's assessment and the accountability of the school had narrowed the curriculum, distorted the distribution of resources, away from A-C grade achievers towards the D candidates. The resultant increased numbers achieving grade C led to questionable data that reflected enhanced test taking strategies as improvements in education, as opposed to what they really showed, improved examination technique.

A single exam has a number of problems, for example, 'examination nerves', might affect an individual's performance on the day. One short test cannot test the whole realm of a child's range of skills and learning over a period of a year or more. Even when accurately marked, the Children, Schools and Families Committee (2008: 22) found that a single test was likely to generate a margin of error of up to 30%. That would mean that one-third of examination grades did not accurately reflect the ability of the person who took the examination or test. Coffield argued that assessment should not be eradicated altogether however, some can be very useful:

> …teachers would be well advised to concentrate on formative assessment rather than on learning styles because the evidence shows that it can 'produce significant, and often substantial learning gains'. (Coffield, 2012: 227)

From this discussion we can see that testing is controversial but now embedded in the English educational system. In using SATs scores to measure children's achievements I am subscribing to an acceptance of their validity even as I challenge the pedagogic practices that embrace such values. My position is one of pragmatism, the system in which I work is not perfect but it is the system in which I must work. The next section looks at the objections to some learning theories and Multiple Intelligences and VAK, in particular.

### 3.3 Arguments against learning theories

The idea of learning styles has gained acceptance and influence within the British educational system. The major influence upon this system is the work of Howard Gardner and his work on 'multiple intelligences' (Gardner, 1993). His work was heavily influenced by Jean Piaget (Piaget, 1950). Gardner's work describes intelligences, which he argued are innate capacities. These intelligences begin as a seed and which can then be developed into an expertise. The theory of VAK grew out of the theory of multiple intelligences (MI) proposed by Gardner. Gardner's theory of MI and VAK, are but two of several theories of learning styles which have been developed over the past 30 years, in particular since the late 1980s.

Coffield *et al.* (2004) identified a 'plethora' of learning styles, which can be categorised into five broad categories, as shown below:

- Learning styles that are largely constitutionally based, including four modes: visual; auditory; kinaesthetic and tactile.

- Those which identify deep seated features of the cognitive structure, or 'ability'.

- Learning styles that are one component of a relatively stable personality type.

- Learning styles that are flexibly stable learning preferences.

- Theories that include 'learning approaches, strategies, orientations and conceptions of learning'.

Coffield and his colleagues selected 13 of the most important and influential models for closer analysis. They looked into the theoretical origins and terms of each model. They also examined the claims made by the authors, external studies of these claims, and independent empirical evidence of the relationship between the learning style and the actual learning that took place. They found that none of the most popular style learning theories had been validated through independent research. The team concluded that the idea of a learning cycle, the consistency of visual, auditory and kinaesthetic preferences and the value of matching teaching to learning styles, were all 'highly questionable'. Coffield and his team are not the only researchers to have made those findings, Demos, a UK think tank, published a report on learning styles, prepared by a group chaired by David Hargreaves. The Demos report (Hargreaves et al., 2005) concluded that, 'the evidence for learning styles was highly variable' and that practitioners were not by any means 'frank' about the evidence for their work.

Learning style theories have been criticised by many. Some neuroscientists and psychologists have questioned the scientific evidence for these models and in particular, the theories upon which they are based. Most educational psychologists believe that there is little evidence for the accuracy of most learning style models and that they are based on dubious theoretical grounds. Stahl (2002: 99) stated 'there has been an utter failure to find that assessing children's learning styles and matching to instructional methods has any effect on their learning'.

White (1998) argued that Gardner chose a somewhat arbitrary set of intelligences. While Gardner recognised the influence of cultural factors, he has missed out several important basic abilities. White exemplifies the ability to recognise different people, what they say, what their position is etc., and all are invaluable attributes of all societies, but Gardner omits them. Gardner pointed out that as long ago as 1948, Gilbert Ryle reminded us 'the boxer, the surgeon, the poet and the salesman' engage in their own kinds of intelligent operation. They work applying 'their special criteria to the performance of their special tasks.' White (1998) goes on to argue that all of this is widely accepted, so we don't need a theory of intelligence to tell us what we already know. He argued that the work of Ryle tells us 'there are as many types of human intelligence as there are types of human goal.' White also questioned the notion of Gardner's small number of categories and questioned whether Gardner can be justified in reducing the myriad of forms of human intelligence into a few categories.

White (1998) analysed the processes by which Gardner selected his intelligences; he asked two questions: How did Gardner pick out his intelligences? How did he identify them? White identified Chapter 4 as the place where Gardner addressed these two questions. Gardner's selection process for his intelligences is that first, the intelligence has to satisfy certain prerequisites and secondly, it has to satisfy the criteria. Those which have survived the first cut can then be 'invited' to join the circle of intelligences.

For Gardner, the first stage is the most important if it fails here, then it has no chance of becoming an accepted intelligence. He states:

> A human intellectual competence must entail a set of skills of problem solving, and must also entail the potential for finding or creating problems. These prerequisites represent my effort to focus on those intellectual strengths that prove of some importance within a cultural context. (Gardner, 1983: 60)

An example of an intelligence that failed the selection criteria is that of the ability to recognise faces because it does not seem highly valued by cultures. As White (2004) argued, it is difficult to see how social interaction would be possible if we could not recognise the faces of family, friends and political leaders. Perhaps for Gardner, unlike Vygotsky, social interaction is not important. To be accepted as an intelligence, the

subject had to satisfy a number of criteria. The criteria that Gardner (1983: 62) identified are listed below:

- Potential isolation of the area by brain damage.
- the existence in it of idiots, savants, prodigies and other exceptional individuals.
- an identifiable core operation/set of operations
- a distinctive developmental history, along with a definable set of expert 'end-state' performances
- an evolutionary history and evolutionary plausibility
- support from experimental psychological tasks
- support from psychometric findings
- susceptibility to encoding in a symbol system

The list of requirements above need to be satisfied by each of Gardner's intelligences, each intelligence had to resolve 'genuine problems or difficulties within certain cultural settings' (Gardner, 1983: 60). Gardner did state that selecting the intelligences, was 'reminiscent more of an artistic judgement than of a scientific assessment' (Gardner, 1983: 62). This set of criteria give an insight into the biological background and training of Gardner, he was by training a biologist, as indicated by point number five. It is also important to note the exclusion of idiots or savants or any intelligence that they might exhibit. This would tend to support the notion of shared intelligence, at the exclusion of 'individual brilliance' or intelligence.

Once accepted, Gardner's biological background comes to light once more. He sees the potential intelligence as a seed that can develop and grow. This suggests that individuals are either born with the intelligence or not, in other words, children may have been born with musical intelligence or they may not have been born with it. If that were the case, the danger for the educationalist would be, 'if he can't do it, then why bother teaching him?' As White (2004) argued, 'Biological seeds, plant or animal, have within them the power to unfold into more complex stages, given appropriate environmental conditions'.

Gardner (1993: 77) stated 'Linguistic competence is, in fact, the intelligence- the intellectual competence that seems most widely and most democratically shared across the human species'. He identified the poet as the highest example of this type of intelligence, but in doing so, Gardner used a literary interpretation of linguistic ability. It could be argued that this is an elitist perspective on language.

Vygotsky (1978) had previously argued that language is a social, cultural, and utilitarian 'tool.' Language is not an ability or competence he argued, and the most important aspect of linguistic ability is in the structuring and mediation of thought. In short, Gardner identified language as an intelligence, whereas Vygotsky sees it as a tool through which we develop our intellectual capacities. The danger of Gardner's interpretation is that, should teachers focus on aspects of language, in order to develop linguistic skills that process might well detract from the conceptual understanding of the child. In addition, teachers need to be aware of the linguistic ability of the child, which is related to the social background of the child in order to scaffold their learning effectively. To focus on linguistic ability within the classroom might well alienate those pupils who are already at a disadvantage within the classroom, as a result of poor sociolinguistic skills. Within the classroom and throughout education as a whole, linguistic ability should be perceived as a tool through which we order thought and through which we learn as opposed to an intelligence in its right.

Gardner also included personal intelligences in his list, these being, interpersonal (relating to others) and intrapersonal (access to one's feelings and emotions). This notion of the separation of these skills is contrary to the views of Vygotsky. Vygotsky believed that the child's cultural development occured on two levels: first on the social level, and later, on the individual level. The first is between people (inter-psychological), and the second inside the child (intra-psychological). This also relates to voluntary attention, to logical memory and to the formation of concepts. All of the higher functions originate as actual relations between human individuals, (Vygotsky, 1986: 57).

Gardner views the processes of interaction between individuals and the development of consequent thinking as separate capacities, rather than both as being part of the learning

process. Gardner's theory fails according to White because it is a theory dependent upon developmentalism:

> Gardner's theory of intelligence is developmentalist. Developmentalism is the theory that the biological unfolding between two poles from seed through to mature specimen that we find in the physical world is also found in the mental world. In his criteria, Gardner acknowledges the two poles in the mental case. At one end, there are allegedly genetically given capacities. At the other end is the mature state, the 'definable set of expert "end-state" performances. (White, 2005: 5)

Developmentalism suffers one important failing; the theory is based on the assumption that what happens in the biological realm is reflected in the mental. There are two problems with this argument, the first is the capacity to unfold into more complex forms certainly exists as a capacity within a seed. The mind is not like a seed it cannot develop into a more complex form (White, 1998:6). Though most are born with the ability to see, hear, understand and think, these mental abilities do not develop into other forms. The mind is not like a seed therefore, so the analogy breaks down.

White did concede that complexity might develop in some ways, such as the desire for specific foods, but such changes were culturally determined:

> They do *change* into more sophisticated versions: the desire for food, for instance, becomes differentiated into desires for hamburgers and ice-cream. But it does not unfold into these. The changes are cultural products: people are socialized into them. (White, 2005: 6)

The second problem concerning developmentalism is that there is an end state, a point at which an organism or body does not grow any further. Any changes after a certain point are to do with maintenance or degeneration, not with growth. When applied to the mind, there is a problem, it would mean that to reflect the physical realm, the mind would have to stop at a certain point, beyond which it would not be able to develop. Put in another way, there would be a ceiling above which an individual could not ascend; learning in each of Gardner's intelligences would stop at a certain point for every individual.

In *Frames of Mind*, Gardner stated, 'it must be admitted that the selection (or rejection) of a candidate intelligence is reminiscent more of an artistic judgement than of a scientific assessment' (1983: 63). From this statement, it can be deduced that the classification of an intelligence is a subjective matter, quite far removed from the claim of it being a scientific process as often claimed by Gardner. Gardner contradicted this by claiming that the intelligences could be measured in some way empirically:

> What I am calling for are sets of intelligences which meet certain biological and psychological specifications.  In the end, the search for an empirically grounded set of faculties may fail. (Gardner, 1983: 61-2)

Later in his writing Gardner added to the list of intelligences. In 1999; he added to the list, naturalistic intelligence and possibly 'existential intelligence.' As with the original list of seven intelligences there are doubts about how the intelligences made the criteria and the list. The real reason for the inclusion of naturalistic intelligence in the list was:

> …valued human cognitions that I previously had to ignore or smuggle in under spatial or logico-mathematical intelligence deserve to be gathered under a single, recognized rubric. (Gardner, 1999: 52)

Having looked at his intelligences, Gardner thought that biological sciences had been a little overlooked. The same could, however, be said of philosophy and religious studies, both of which are poorly represented in the scheme. According to White, 'All this lends strength to the suggestion that what really powers MI theory is the attempt to identify all major divisions of the intellectual life' (2005: 14). In effect, Gardner is doing the same as Paul Hirst did in the 1970s with his book Knowledge and the curriculum, in which Hirst attempted to classify knowledge in all of its forms (Hirst, 1978: 56).

There is one aspect of Multiple Intelligences that is not only negative, labelling is also potentially damaging. Gardner believes that while most children possess some of all of the intelligences, some of them have particular aptitudes in one or more of them:

> My own belief is that one could assess an individual's intellectual potentials quite early in life, perhaps even in infancy. (Gardner, 1983: 385)

This is counter to the work of Dweck and Syed. Both Dweck and Syed believe that intelligence is not fixed, but that it can be developed: through a growth mind set in the case of Dweck (2006); and effort and purposeful practice in the case of Syed (Syed, 2010:51-71). Borrowing Dweck's terminology, any teacher who walked into a classroom at the start of the year and saw the children who were behind and believed that they would stay there, would have a fixed mind set. I would put it even more strongly: any teacher who believed that the children at the 'bottom of the class' would stay there and end the year at the bottom, would be failing in their duties and would certainly be failing the children in their class.

Multiple Intelligences could be used to damage children in another more insidious way. The theory has been used by some religious schools, in this case a Catholic school, to argue that children are developing God given talents. 'One of the appeals of MI theory for them is that it reinforces the Christian belief that all human beings are born with unique God-given talents' (White, 2005: 18). The reason that this might be so damaging, is that children who are then told that they have, or do not have a certain God given talent, would simply give up and not try to develop themselves through effort. The consequence of that is that if children believed that to be the case, then they would not put any effort into areas they found challenging or difficult. Not only would that be counter to the aims of education, it could potentially profoundly affect the prospects of a country, if large numbers of children gave up on what they seemed to be 'no good at.' I will now look more closely at the arguments against VAK.

### 3.4 Arguments against VAK

Franklin (2006:84), stated, 'more importantly for teachers is the fact that Gardner's multiple intelligence theory, if applied in terms of learning styles, becomes a reductivist notion, where individual learning is perceived as a capacity, not a process'. Franklin added that 'it has been melted down into a theory of learning styles, which in turn has been reduced to three visual, auditory and kinaesthetic: VAK, which teachers are encouraged to assess as individual pupils' learning styles' (Franklin, 2006:84).This stereotypes each pupil as being exclusively one particular type of learner, which can in turn send out a problematic message to all involved in the education process, including the parent, teacher and the child themselves.

Franklin (2006) went on to argue that the 'VAKists' add the auditory dimension to their model. She pointed out that this is not an intelligence identified by Gardner, but as with the visual and kinaesthetic is merely a description of our senses. In other words, the VAK theory describes our senses, not how learning occurs. The kinaesthetic learning style carries the danger, if attached to a pupil, of labelling them as non-academic.

Gardner's inclusion of kinaesthestic intelligence stemmed from his admiration of the French mime artist, Marcel Marceau. This form of 'intelligence' however, like that of musical intelligence- requires practice. To be the 'best in the world', it requires enormous amounts of time and effort when practising; as Franklin (2006), stated 'the innateness of such a skill is arguable'. Both Vygotsky and Piaget proposed activity based learning, but they intended such activities to be for all, not just the more dextrous or active ones:

> Manipulating cards, ordering the big ideas and their supporting little ideas in practise reinforces learning. These strategies should not be used to calm active pupils, or as a sop to the non-academic sporty ones, but positively as an aid to learning. (Franklin, 2006: 84)

Sharp *et al.* (2008) undertook a study to investigate the awareness and use of VAK by teachers in UK schools. They found that:

> VAK was described to us in some capacity in almost every one of the 76 responses obtained with a little under half of the teachers indicating that either they personally or their schools were using VAK to help them plan and teach, occasionally at a whole school strategic level. (Sharp *et al*., 2008: 89)

The researchers were concerned, because there was a widespread practice of spreading VAK by 'word of mouth' as second-hand information. In other words, teachers did not question the information nor did they read or research for themselves, the concept was merely accepted and used in their practice. At least one expert in the field would support and excuse teachers for this failing:

> MI theory comes to schools "shrink-wrapped", as one teacher put it to me. This is understandable since schools do not have the time to investigate all the ideas that come their way that look as if they have some mileage in the classroom. (White, 2005: 1-2)

Sharp and colleagues (2008) also found common association between VAK and 'such disparate concepts' as accelerated learning, multiple intelligences and brain gym. The concern is that a concept, any concept, should be allowed to spread and influence educational practice without prior validation or checks by educationalists.

The theory of VAK has been linked to the work of Alistair Smith (1998), who also founded Accelerated Learning in Primary Schools (ALPS). He claimed that he did not think of the term accelerated learning, nor VAK. He did claim to have brought each of those concepts together into one coherent approach or learning model for the purpose of classroom application. He also claimed deep-rooted associations for VAK with reference to neuro-linguistic programming; none of this however had been supported by the scientific community:

> The discipline of NLP (Neuro Linguistic Programming) concerns itself with observing the subtleties of human behaviour and particularly how we communicate with others and ourselves. The work of pioneers of NLP...  has now progressed to such a degree that we are able to identify three distinct communication and learning preferences (VAK)...  We do, to some extent, utilise all three (sensory modalities). (Smith, 1998: 146-147)

From this passage, one might expect Smith to argue against an individual adhering to one learning (VAK) style, this did become more ambiguous in some of his other writing, however. When writing about individual learning preferences, Smith argued that they could be 'discerned through noticing different (psychological and linguistic) clues' (Smith, 1996: 42). Smith continued to state that children with visual learning styles preferences might direct their gaze or move their eyes upwards. Their breathing might be shallow and take place high in their chests, their voices might come across as high pitched, and they might answer with terms such as 'I see what you mean'. Smith also offered a VAK learning styles questionnaire, in so doing; he implied that learning style could be determined for all children regardless of age or interest. Smith did, however, later state that children would not adhere to one learning style; something supported by the findings of this research:

> Children will not use one sensory approach to the exclusion of all others and it is verging on the absurd to say that a child is a visual, auditory or kinaesthetic learner. (Smith and Call, 1999: 191)

A problem appears to have developed from the way in which knowledge of VAK had spread throughout the primary school system. It was passed from teachers to heads of schools and governors by word of mouth, and few if any, ever went to Smith's work to read it for themselves.

Sharp *et al.* also found that what VAK described was confused by teachers. Whether it was a learning instrument, a learning theory or teaching method, the distinction is neither made nor asked for. Smith is also guilty of 'blind' unquestioning acceptance of the theory, he accepts and adopts Multiple Intelligences (MI) without question:

> Smith, however, approaches multiple intelligences in the same way he approaches learning styles. MI theory debate is adopted almost without question, with little regard to any aspect of MI theory debate, and presented in an almost entirely unproblematic way. (Sharp et al, 2008: 92)

The association of MI and VAK was made in ALPS, the accelerated learning programme. Smith believes that within ALPS, it is possible to determine an individual's balance of multiple intelligences then address this balance using a range of VAK activities that he presented himself. Both Smith and Gardner acknowledge differences between the two theories, Gardner argued:

> Without doubt, some of the distinctions made in the theory of multiple intelligences resemble those made by educators who speak of different learning or working styles... But MI theory begins from a different point and ends up in a different place from most schemes that emphasise stylistic approaches. (Gardner, 1993: 44-45)

Smith did qualify his early work in particular in his book Accelerated learning in the classroom, first published in 1996. In the book, he admitted that brain research does not validate any learning approach, he did not however at that time question or dispatch VAK.

When Coffield was asked the question, 'what kind of outcome do we as educators want from introducing students to the notion that there is a variety of ways in which we

learn?' (Coffield, 2012: 225). He argued that there was an ideal response and one that was highly undesirable. The ideal response was a reply by an eleven-year old girl to an inspectors question, 'What kind of learner are you?' The girl replied, 'I'm all types rolled into one.  And I use different styles, depending on what I'm doing and how I'm doing it' (Coffield, 2012: 225). He continued, 'the nightmare reply would be: I'm a kinaesthetic learner, and I expect the whole curriculum to be presented to me kinaesthetically. So there's no point in talking to me- I'm not an auditory learner. And there's no point in showing me diagrams, pictures or films- I'm not visual either' (Coffield, 2012: 225).

When I realised the unpopularity of VAK, I had intended to leave RQ1 out of this work and throw away the results that I had analysed. I changed my mind for two reasons; the first was that as Coffield and his colleagues (2004) pointed out learning styles have not been tested. The second reason was that I realised that the results supported the rejection of VAK as having any notion of fixed learning preferences. The results are not presented in chapter five along with the other findings because they no longer form part of the main body of this work. The findings of the first research question are therefore presented below.

### 3.5 RQ1: Are learning styles consistently chosen by individuals?

This question relates to the cognitive strand. Some theorists have held the belief that 'learning style is a fixed trait' (Dunn *et al.,* 1985, Gregorc, 1985 and 1998). VAK in 2004 was the most frequently used learning style model in use in the US and UK (Ginnis, 2004: Tileston 2004). Sprenger (2003) argued that sensory systems were crucial to learning, in addition, information was to be processed if there were more senses activated. Teachers ought to be able to identify the learning styles of children, but the children themselves should also be aware of their sensory pathways. 'It is important that teachers know the 'preferred sensory pathways' of their students but even more vital that the 'students understand their preferences, so they can lead with their strengths' (Sprenger, 2003: 45).

To determine whether children claimed the same learning style over the period of a year, the children were tested. The children were asked to complete a questionnaire at

the beginning of the academic year in September then a second time towards the end of the academic year in July. One-year group of year sixes (n=28) was tested and the results are presented below. There were two possible effects of the research upon the children.

- The first was The Hawthorne Effect where the respondents of a questionnaire answer in the hope of pleasing the person who gave them the test, in this case, the teacher. Their answers are not necessarily their true feelings, but what they think the teacher wants them to say.

- The second potential effect of the research was that the research was carried out by someone in a position of power, and this needed to be minimised through the research design.

To address possible bias such as the Hawthorne effect (discussed in chapter four), the questions on the questionnaire were then rearranged and the children were asked to complete it a third time a few weeks after they had done so in July. There were sixteen questions on the questionnaire asking for their learning preferences (see appendix one). I hoped that the power dynamics were addressed as much as possible through Pupil Voice, the children felt able to comment about work and to suggest improvements. In truth, teacher-pupil dynamics can never be truly equal.

Analysis of the learning styles from the questionnaires was done online by a professional website[12]. When I was doing the learning style analysis, in 2010, I used a site in New Zealand which charged a fee for the analysis of the questionnaires. Today there are many free VARK self-assessment sites, but at that time, there was none that I could find. I also felt however that using a professional site not involved or aware of the research would reduce the chance of researcher bias.

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[12] The VARK questionnaire can be found at:
http://www.vark-learn.com/english/page.asp?p=questionnaire

**Table 3.1          Claimed learning preferences in September and July 2010**

Numbers of each class the same to within two choices

| Child | 1.Claimed learning preference in September | 2.Claimed learning preference in July | 3.Hawthorne effect- answers rearranged |
|---|---|---|---|
| 1Ch | v/r | k/r | v/r |
| 2To | v | np | np |
| 3Ab | r | k | k |
| 4Na | np | np | np |
| 5Ha | R | R | k/r |
| 6Ma | np | np | np |
| 7Ma | v | np | np |
| 8BeH | np | a | np |
| 9JF | V | V | V |
| 10Al | v | v/k | np |
| 11Es | V | V | V/r |
| 12Sm | r/k | r/k | r/k |
| 12J | a/r | r | r |
| 13Fl | v/r | A | A |
| 14Ax | v/k | v | v |
| ON7 | np | np | np |
| 16WM1 | v/r | R | V/r |
| 17NEa | R | R | R |
| 18Ea | R | R | R |
| 19El | R | R | a/r |
| 20BJ | np | np | np |
| 21Jo | np | v | np |
| 22Sa | k | Slight k | K/v |
| 23JW | a/k | a/k | r/k |
| 24Em | v | V | v/k |
| 25Ca | v/a | v/a | v/a |
| 26So | np | np | k/r |
| 27Mi | R | R | R |
| 28Aa | np | r | np |

Key:   Small letter- majority learning style

Capital letter- strongly claimed preference.

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I was required to ask the children to complete the questionnaires and then to upload them to the website for analysis. They did not share their methods or criteria used to assess the students. As a result of their nondisclosure, I was required to accept their findings without question. The results below are, therefore, I trust, validated by the professional website.

I had not been aware of the Hawthorne effect in the first year of study, as a result I did not test for the effect. From the table 1 above, it can be seen that the responses to the questions on the questionnaires is not wholly consistent. The claimed learning style preferences of the children varied in most cases. Nine or 33% of the children responded consistently to the questionnaires such as 4Na, 9JF and ON7. The claimed learning style of those children was the same when their responses to the questionnaire completed in September was compared to their responses given to the questionnaire completed in July. In addition, their claimed learning style was the same when the questions were rearranged in order to test the Hawthorne effect. Four of those children however had no preference for any learning style. Only five reported a consistent choice of any one learning style which represents just under 18%.

One child, 11Es emerged as a visual learner in September and July, but as a visual and reading learner when the questions were rearranged. Despite the apparent inconsistencey, 11Es was quite consistent in her choices; reading was until recently considered part of visual learning. Before I began this research, I had assumed that all children would respond consistently to the same question on a questionnaire. Several researchers have reported preferences for a particular mode of learning. In one study involving the learning preferences of trainee teachers, it was found that 'the data shows that most (92%) secondary trainees in the study indicate a preference for specific styles of learning'(Wood, 2011: 94). Similar findings were made by other researchers including Austin (2004) Petty (1998) and Pritchard (2005).

Nine children claimed two learning styles, but with some degree of consistency. These children, including 5Ha, 12J, and 19El, had at least one of their learning styles consistently chosen from September to July and still claimed when the Hawthorne effect was tested. 23Jw, for example, emerged as a kinaesthetic learner on three

questionnaires, but in each case, he had two learning styles with equal prevalence. In September and July, he was also an auditory learner, but when the Hawthorne effect was tested, he emerged as a reading learner as well as being a kinaesthetic learner. These findings reflect those of other researchers, 'the data indicate that a majority of trainees in the study express two or more preferences for particular types of learning' (Wood, 2011: 81).

The learning outcome of four children, for example, 13Fl and 7Ma emerged as being different when their responses to the questionnaires for September and July were compared. When the responses to the July questionnaire were compared to those given on the Hawthorne effect however, their learning style came out as the same as July, but different from September. Three other children had different learning styles when their responses to the questionnaires in September and July were compared. In the case of those children, learning styles emerged as the same when their learning style for September was compared to the learning style of the Hawthorne effect questionnaire.

Two other children responded to the questionnaires consistently in September and July. They emerged as having a different learning style, however, when those results were compared to their learning style in response to the questions having been rearranged to test the Hawthorne effect. Overall however, the results show some degree of consistency for some of the children when the responses to the questionnaires are compared, but the learning preference is not consistent for the majority of children. In my analysis of answers given to individual questions, I found that only 9% of questions were answered the same in the tests given in July, September and to test the Hawthorne effect. In other words, even children who claimed the same learning style on all three tests did so by giving different answers to most of the questions.

It would have been more unexpected had the responses been consistent, results from studies of learning style preference have varied greatly. Raven *et al.*. (1993), found that 71% of trainee teachers had a sensing preference (based on Kolb's experiential learning theory). Peker (2005), found that 25.8% of maths trainees preferred a converging (sensing) style of learning but only 5.2% claimed the intuitive (diverging) learning style. Peker and Mirasyedioglu (2008), reported that 28.1% of pre-service trainees

preferred converging approaches while very few adhered to the diverging approach. On the other hand, Cavas (2010) found that only 17% of the 606 maths trainees in one study claimed a converging learning style in contrast to 40% who claimed a diverging style of learning. The findings of the studies contradict each other, or it might be that learning style preference relates to the subject being studied:

> It is also possible to identify 'typical' and 'atypical' learning styles preferences for trainees across different subject disciplines. Trainees in mathematics and science, for example, share a consistent preference for both visual and sensing approaches. English trainees characteristically favour intuitive and verbal approaches. (Wood, 2011:81)

When I initiated this research, I had no idea of the learning styles of any of the children, nor did I have any idea of the 'strength' of their learning style. From the results, it would appear that while many have moderate preferences for their learning style, and a few have strong preferences, a significant number have a weak preference or very weak preference:

> The researcher would do well to examine only students with moderate or strong preferences. The students with mild preferences would be expected to shift between categories. (Felder & Spurlin, 2005: 105)

Those with a weak preference would appear to have changed their learning style preference, perhaps those children should have been excluded from the results as advised by Felder and Spulin (2005). I felt however that their inclusion gave validity to the findings. I would have felt that I had been selective with the findings had I left the results out, and the results would in my mind have been distorted.

### 3.6 Summary of the arguments against VAK

It should be kept in mind, when we discuss learning styles, that, the 'preferred' learning style is neither fixed nor innate. The preferred learning style may well vary in relation to location, task or the mood of the learner. It may well also change over time; it may well be that early learning is largely kinaesthetic, but largely visual later in childhood. It should also be noted, that there is little or no evidence to support learning skills theories, or that, at best, learning theories have questionable theoretical foundations. The question should be asked 'should we throw out VAK entirely?' I would argue that we

should not. VAK helps the teacher to plan which includes three ways of learning in so doing. As a result, lessons have more variety and are more accessible to the children, irrespective of whether learning styles can be supported by evidence or not. Coffield recommended that:

> Instead of being assigned to a particular learning style, it would be more beneficial for students to appreciate the relative advantages and weaknesses of a range of different styles. The aim for teachers would be not only to study how the students learn but also to show them how to enhance their learning by developing a flexible repertoire of approaches to learning rather than settling just for one. (Coffield, 2012: 225)

Coffield did not argue that VAK should be thrown out of the debate about learning entirely, this implied that learning styles should be included in the education of children. He stopped short of recommending the assessment of learning styles, however. Children should not be labelled as having a particular kind of learning style. From the results to RQ1, it can be seen that only four children, 9JF, 17NEa, 18Ea and 21Mi claimed a strong preference over the three tests towards one learning style. In summary, the literature dismisses VAK, and the findings of this work support that argument. The next chapter, investigating the learning focusses on the methodology used in this study.

# CHAPTER 4

## INVESTIGATING THE LEARNING

### 4.1 Introduction

The study school is a two-form entry and both classes of year six children (N=57) were involved to ensure that all children in the year group were taught the same material. It is a research project designed to determine whether kinaesthetic learning improved story writing. I gathered three types of data; the first was quantitative data in the form of raw SATs (Standardised Attainment Tests) scores and levels attained in assessed written work. The second was qualitative data in the form of the opinions of the participants (the children) which I collected in the form of questionnaires; the third comprised interviews and anecdotal evidence. Quantitative data were subjected to statistical analysis; statistical analysis was carried out to first test normality of the dependent variable. Then after the initial analysis, the most appropriate method was decided based on the test results (parametric or nonparametric methods). The Kolmogorov-Smirnove test and Shapiro-Wilk test were used to test normality of the dependent variable. Qualitative data were analysed and used to triangulate the results, and included surveys, interviews and questionnaires. Triangulation is a technique that validates data or findings using two or more sources. This research is a case study, the advantages and disadvantages of which will be discussed later.

However, before I discuss the methodology, I note that one aspect of the data described in this thesis might confuse someone who is not a teacher: that is the numbering system used to describe levels in the attainment of children. Teacher assessment of pupil performance (using past SATs tests) was used to address the first three research questions. Teachers described levels in two ways, either with two numbers or with a number and a letter; the equivalences are shown in table 4.1.

**Table 4.1 The level equivalents**

| Age at which children were expected to achieve the level | At the age of eight (Year four) | | | At the age of eleven (Year six) | | | At the age of thirteen (Year eight) | | |
|---|---|---|---|---|---|---|---|---|---|
| Numerical level | 3.0 | 3.3 | 3.7 | 4.0 | 4.3 | 4.7 | 5.0 | 5.3 | 5.7 |
| Level with letter description | 3c | 3b | 3a | 4c | 4b | 4a | 5c | 5b | 5a |

Methodology is the plan of action used to carry out this research: the plan links methods that I used to collect and analyse the data that were intended to answer the original research question. The original research question in this research was 'does kinaesthetic teaching improve the story writing of children?' The methodology, how the research was designed, which data were collected, how the data were collected and analysed were all intended to answer that question. The research does not fall conveniently into one camp, it is neither quantitative nor qualitative in nature; rather it uses a mix of both quantitative and qualitative data. School-based research often uses both methods:

> School-based research tends not to adopt such a polarised stance to methodology and is more likely to be situated in the middle of this continuum. (Wilson, 2009:58)

This view was echoed by other researchers in earlier works, who felt that the methodology could not be conveniently parcelled into different packages. Though they are discussing grounded theory, the principle can be applied to other methodologies:

> Moreover, methods are not uniformly linked to paradigms. (Greene & Caracelli, 1997) Grounded theory may be conducted in a neopositivist or constructivist paradigm. (Annells, 1996)

> Although the various dimensions of phenomena may be method linked in that different dimension may be best captured by different methods, methods, like paradigms, are not specifically linked to techniques. Grounded theory may be

generated using an array of qualitative and quantitative data collection techniques and sources. (Sandelowski, 2000:247-248)

Traditionally, research had been classified into two types, pure and applied. The implication was that pure research started with a theory that would then be tested in the real world, and that in some way, pure research was superior to applied research. This is not a good description of what happens in the 'real world' however where academia generates theories and does not merely test or apply pure theory. In the real world, there is a:

> Threefold classification of research: exploratory, testing-out and problem solving, which applies to both quantitative and qualitative research. (Phillips and Pugh, 2006:51)

Exploratory research is involved in finding out about a new problem issue or topic about which little is known. As a result, in the beginning, the research cannot be very well formulated and may have a theoretical or empirical basis. Like the present research work it might use existing theories, or it might have to develop new ones, it might use existing methodologies, or it might have to initiate new ones. The intention will be to find out something useful. Testing out research might try to define the limits of previously proposed generalisations. For example, it might try to discoverer whether X is true of all young people, whether X works at low temperatures or whether it is true of new industries. The third type of research, problem-solving research begins in the real world and tries to discover whether intellectual theories can be used to find a solution.

## 4.2 The case study methodology

Bassey (1999: 65) is one of the leading authorities on case study, he stated that 'research is a creative activity and every enquiry had its own unique character'. He also argued that research goes through stages if that research is to be trusted 'about trying to make a claim to knowledge, or wisdom, on the basis of systematic, creative and critical enquiry' (Bassey, 1999: 66). There are many different types of case study; it is through a discussion of two of the main proponents of case study, Stake and Yin that I will classify this work. The difference of opinion about case study is the result of the way in which the experts view knowledge generation (the epistemology of knowledge). Stake and Yin have their own epistemic commitments which impact on their perspectives on

case study methodology and the principles and the steps they recommend emerging researchers to adhere to when using the case study method. As Merriam notes (1998: 3), 'Research is, after all, producing knowledge about the world – in our case, the world of educational practice'.

Stake argues that 'How case study researchers should contribute to reader experience depends on their notions of knowledge and reality' (Stake, 1995: 100). From Stake's viewpoint, constructivism and existentialism (non-determinism) should be the epistemologies that orient and inform the qualitative case study research since 'most contemporary qualitative researchers hold that knowledge is constructed rather than discovered' (Stake, 1995: 99). Stake argues that qualitative case study researchers are interpreters and gatherers of interpretations which require them to report their rendition or construction of the constructed reality or knowledge that they gather through their investigation.

Stake divides case study into three types, 'intrinsic, instrumental and collective' (Baxter and Jack, 2008:554). Intrinsic is used by Stake for researchers who have a genuine interest in the case and who wish to better understand the case; in other words, the case itself is of interest. Where cases are not typical of other cases, Stake uses the term instrumental to describe the case study. Instrumental case studies provide an insight or to help to refine a theory, the case itself is of secondary interest. In their classification of case studies, Baxter and Jack (2008: 548-549) also listed two other types of cases studies, both described by Yin (2003), collective and multiple-case studies.

Stake defined the case study as 'a bounded system' and he investigates into it 'as an object rather than a process'. He depicts some of the attributes of case in his conceptualization: case is 'a specific, a complex, functioning thing', more specifically 'an integrated system' which 'has a boundary and working parts' and purposive (in social sciences and human services) (Stake (1995: 2).

Yin argues against those who make distinctions between qualitative and quantitative orientations due to the irreconcilable philosophical disparities: 'regardless of whether one favours qualitative or quantitative research, there is a strong and essential common ground between the two' (Yin, 2002: 15). Yin argues that the two research traditions

(qualitative and quantitative) can be used in both the design and methods used in a case study, so he does not distinguish between the methods.

Yin (2009: 18) offers the following defintion of a case study.

A case study is an empirical inquiry that:

- Investigates a comtemporary phenomenon in depth and within its real-life context, especially when, the boundaries between phenomenon and context are not clearly evident.

The case study inquiry :

- Copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
- relies on mulitple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
- benefits from the prior development of theoretical propositions to guide data collections and analysis.

Yin (2009: 17-18) argues that there are three types of case study used for research, they are: explanatory or causal case studies; descriptive case studies and exploratory case studies. Explanatory case study is used where the answer to a question is sought to explain situations that are too complex for experimental strategies, such as analysing a web based learning community. The descriptive case study is used to describe a real life context in which it occurred, such as understanding the needs of women with Parkinson's disease. The third case study is used to explore situations in which the intervention being evaluated does not have a clear set of outcomes, this might be used to investigate the development of a nurse-patient relationship. The divisions between the methods is not always clear however:

> An important caution, however, the clarification does not imply that the boundaries between the methods – or the occasions when each is to be used – are always sharp. Even though each method has its distinctive characteristics, there are large overlaps among them. (Yin, 2009: 8)

The diversity of case studies was also reported by Cohen et al (2007: 258); they argue that the diverse nature of case studies is the result of the method being used in a variety of disciplines, such as education and social sciences. The feature that binds the various types of case studies together is perhaps the method of observation.

> Whatever the problem or the approach, at the heart of every case study lies a method of observation. (Cohen, et al, 2007: 258)

In terms of this work, I view knowledge as constructed by the learner, as such, the present study adheres to the case study view of both Stake and Merriam. I was genuinely interested in the case itself, the case being the impact of kinaesthetic teaching on story writing, so in terms of Stake's classification, this work is intrinsic in nature. When I set out, I did not know whether I was going to explore, explain or just describe the impact of kinaesthetic teaching and learning on children's story writing. Yin (2009: 6), offered an example of an explanatory case study. He argued that Graham Allison's (1971) study of the Cuban missile crisis is an example of an explanatory case study, because it explains the crisis as well as describing and exploring it. I have described the impact and explored the impact of kinaesthetic work, I have also explained how kinaesthetic work has impacted upon story writing, at least in part through the fusion of two new concepts as described further in chapter six. In terms of the classification offered by Yin (2009), this work is an explanatory case study.

Research that involves more multidimensional characteristics such as interviews or questionnaires that are open-ended questions are better suited to a case study methodology. Quantitative approaches to research have been the traditional approach. Quantitative methods are particularly useful where 'activities and behaviours can be counted or measured; they are less effective in analysing complex, multidimensional characteristics of a phenomenon' (Flood *et al.*, 2005: 125). Case study is recognised as a useful tool in many social science studies. Case study is a useful methodology in a range of subject areas. Those subject areas include: education (Gulsecen & Kubat, 2006), sociology (Grassel & Schirmer, 2006) and community based problems (Johnson, 2006), such as poverty, unemployment, drug addiction or illiteracy. In the present study, the phenomenon was kinaesthetic teaching and learning methods within the context of

story writing, and the real-life context was that of the school environment. The multiple sources of evidence that were derived and used and which are discussed below include empirical data derived from SATs tests, and qualitative data from interviews and questionnaires.

Case studies have become more prevalent following the growing dissatisfaction with experimental research. Case studies have a long history, Oliver Sacks (1985), a neurologist in the preface to his book 'The Man, who Mistook His Wife for a Hat' traced case studies back to Hippocrates. Hippocrates studied disease in terms of having a course from the first onset of the climax or crisis. That is not to suggest that one methodology prevails over another; methodology tends to go in and out of favour. Case study as a method declined in the 1960s due to a preference for quantitative methods then case study declined further still due to the rise of grounded theory that was developed by Glaser and Strauss in 1967. Following its fall in popularity, the case study returned to popular use in the 1980s.

> This trend of continuous, albeit somewhat infrequent, useage continued through most of the 1980s, and more recently, the popularity and frequency of case studies have increased. (Wilson 2009: 205)

An early example of case study in writing was conducted by Emig in 1969 that looked at the composing processes of successful English-speaking of eight 17-year old students as they wrote in various modes. Emig then collected the writing of the students; she produced what was a tentative profile of the composing processes of 17-year olds. Other researchers have used case studies to investigate the writing of their students including Mishel (1974), Pianko (1977) and Perl (1979). The use of case study to investigate writing has a long history, and it is a well-established methodology used in the study of writing.

### 4.3 The advantages of a case study

The case study provides a unique opportunity to study real people in real situations; the case study provides the opportunity for readers to understand ideas instead of presenting them with abstract ideas theories or principles. According to Nisbet and Watt (1984:72-

3) the case study can help people understand how ideas and principles can fit together. Due to the analytical nature of case studies, they have the potential to discover phenomena in ways that numerical analysis is not able to, numerical analysis merely arrives at a statistical generalisation. Flyvbjerg (2004: 421) argued 'the view of human behaviour cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process'. Human behaviour is too complex to understand solely with the use of numbers and statistics.

Hitchcock and Hughes (1995: 317) outlined the benefits of a case study; the following list was taken from their book called *Research and the teacher*:

- It is concerned with a rich and vivid description of events relevant to the case.

- It provides a chronological narrative of events relevant to the case.

- It blends a description of events with the analysis of them.

- It focuses on individual actors or groups of actors and seeks
  to understand their perceptions of events.

- It highlights specific events that are relevant to the case.

- The researcher is integrally involved in the case.

- An attempt is made to portray the richness of the case in writing up the report.

One of the advantages of case study is that it can give a more complete picture, and include relevant information missed by other forms of research that might have been more carefully designed and organised:

> They retain more of the 'noise' of real life than many other types of research. Indeed, other forms of research, such as the experiment or a carefully structured questionnaire survey, base their success on the ability to exclude such noise, and focus precisely upon the particular phenomenon or possible causal relationship that is to be investigated. There are good reasons for doing much research in this way, but an unavoidable problem with it is that in some circumstances, the excluded noise may be a highly significant part of the story. (Hodkinson and Hodkinson, 2001: 3)

Case studies can also identify the cause, and they observe the effects in the real context. In case study the context is an important determinant of both cause and effect in itself. The present study was more complex than it might at first appear, the impact of kinaesthetc teaching on story writing draws in a lot of other factors and initiatives (that were discussed in chapter two). Motivation, metacognition, imagination amongst other factors played a role in the outcome, and kinaesthetic teaching could not be isolated in itself from the other phenomena. This point was argued by Sturman (1999: 103) 'a distinguishing feature of case studies is that human systems have a wholeness or integrity to them rather than being a loose connection of traits'. This wholeness requires the more in-depth investigation that a case study allows as opposed to the more limited narrow focus of a statistical empirical investigation.

The boundaries of the case study are set; the boundaries are set at one time, within one geographical area and within other constraints such as the institution and those involved in that particular case study. Some authorities warn the researcher against becoming too journalistic and sensationalist. Nisbet and Watt (1984: 91) inform the researcher not to be too journalistic by selecting the most striking features, not to use an anecdotal style, nor selective reporting. The case study involves the results and opinions of a real life context at one particular time. While it is descriptive and detailed, it does have a narrow focus, and it involves the subjective as well as objective data:

> It is important in case studies of events and situations to be allowed to speak for themselves, rather than to be largely interpreted, evaluated or judged by the researcher. In this respect, the case study is akin to the television documentary. (Cohen *et al.*, 2007: 254)

A case study is a form of narrative, a story that unfolds to the reader, the researcher must firstly decide upon the evidence or data that will be collected. 'It is not uncommon for case study researchers to use a variety of data collection procedures, including observations, interviews, records, reviews and others' (Flood *et al.*, 2005: 127). One of the methods the researcher can use to ensure that the story is valid is triangulation. 'In case study work, triangulation is considered a process in which researchers use multiple

perceptions to clarify meanings. In other words, researchers look either across cases or types of data collected for evidence of the phenomenon' (Flood *et al.*, 2005: 127).

Another advantage of the case study is that the way in which data is examined, because it is often conducted within the context of its use (Yin, 1984). That would be very different from an experiment that deliberately isolates a phenomenon from its context, focusing on a limited number of variables (Zaidah, 2003). In conclusion, Flyvbjerg when concluding his argument against the five misconceptions of case study research, argued that:

> Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is, therefore, more valuable than the vain search for predictive theories and universals. (Flyvbjerg, 2004: 423)

### 4.4 Issues and problems with case study methodology

Many of the criticisms of case study can be turned on their head and made into positives, a point that was argued by Wilson (2009). A thorough rebuttal of the criticisms of the case study was given in an earlier paper 'Five misunderstandings about case-study research' (Flyvbjerg, 2004: 421). In that paper, Flyvbjerg listed the misunderstandings that were: that general theoretical knowledge is more valuable than practical knowledge. The second misconception was that one cannot generalise on the basis of an individual case, for this reason, case study cannot contribute to scientific knowledge. While the case study might be suitable for generating hypothesis, other methods are more suitable for testing the hypothesis and for theory building. The fourth misunderstanding is that the case study tends to include a high degree of bias, it tends to confirm the researcher's ideas and prejudices. The fifth misconception is that it is often difficult to develop a theory based on a case study:

> These five misunderstandings indicate that it is theory, reliability and validity that are at issue; in other words, the very status of the case study as a scientific method. (Flyvbjerg, 2004: 421)

I will now address the concerns above. Yin (1994) offered three potential remedies to counteract some of these misunderstandings. He proposed using multiple sources of

evidence, establishing an evidence chain 'key informants' review a study report. It should be noted here that in the present study, multiple sources of evidence were sought to inform the findings. In summarising his argument against the argument that general theoretical knowledge is more valuable than practical knowledge, Flyvbjerg wrote:

> Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is therefore more valuable than the vain search for predictive theories and universals. (Flyvbjerg, 2004: 423)

It is clear that a generalisation cannot be made from a single case, this was addressed by Wilson (2009: 205). She stated: 'unlike random sample surveys, case studies are not representative of entire populations, although they do not claim to be'. In an earlier paper, Flyvbjerg (2004: 423-425) argued that the rejection of Aristotle's law of gravity by Galileo based upon observations was not made 'across a wide range'. The rejection of Aristotle's law of gravity was made following the invention of the air pump. The air pump made it possible for the creation of a vacuum, through which were dropped a coin and a feather that dropped at the same rate. As argued by Flyvbjerg (2004:423) 'random and large samples were at no time part of the picture'. Most science is conducted through carefully chosen small-scale cases, including the works of Newton, Darwin, Einstein, Marx and Freud. Flyvbjerg rejected the second misconception and concluded:

> One can often generalize on the basis of a single, and the case study may be central to scientific development via generalization as supplement or alternative to other methods. But formal generalization is overvalued as a source of scientific development, whereas 'the force of example' is underestimated. (Flyvbjerg, 2004: 425)

The third misconception, that case study can generate a hypothesis, and that other methods are more suited to test the hypothesis or to theory building is countered by Cohen and colleagues. They stated: 'Case studies can make theoretical statements, but, like other forms of research and human sciences, these must be supported by the evidence presented. This requires the nature of generalization in case study to be clarified' (Cohen and colleagues, 2007: 254).

Giddens (1984) in a critique believed case study methodology to be 'microscopic' because it lacked a sufficient number of cases. Wilson (2009: 205) disputed this, 'provided the researcher refrains from over-generalization, case study research is not

methodologically invalid simply because selected cases cannot be presumed to be representative of entire populations'. Quantitative research involves generalizations made about a whole population based on a representative sample. Case study involves a generalisation of a theory based on cases selected to represent aspects of that theory, this discussion also addresses the fifth misconception.

The fourth misunderstanding is that the case study tends to include a high degree of bias, rendering the findings of the case study scientifically invalid. Francis Bacon (1853) believed this to be a drawback as an essentially human characteristic and not just an issue with the case study. 'The human understanding from its peculiar nature, easily supposes a greater degree of order and equality in things than it really finds' (Bacon. 1853: xlvi). Flyvbjerg (2004: 428) discusses what he calls a 'bias towards verification' and which he argues is general. Many researchers find that their preconceived ideas and opinions were wrong. Flyvbjerg (2004: 428) listed a number of researchers who have used case study and have reported their preconceived views to have been countered. Amongst the researchers are, 'Campbell, Ragin, Geertz, Wieviorka, Flyvbjerg'.

In this study, I began with a number of preconceptions most of which were dismissed by the findings. An example of my rejection of a preconceived idea (discussed in chapter five) was that the kinaesthetic learner would benefit more from kinaesthetic teaching than other learning styles. The advantage of the case study is that it allows an in-depth focus on a real life situation it can then test views directly as various phenomena appear in practice. In concluding his argument against case study bias, Flyvbjerg argued that:

> The case study contains no greater bias towards verification of the researcher's preconceived notions than other methods of inquiry. On the contrary, experience indicates that the case study contains a greater bias towards falsification of preconceived notions than towards verification. (Flyvbjerg 2004: 429)

Finally, some members of the scientific community dislike the case study method because they believe that researchers who use it, sometimes violate the principle of falsification. Ideally, the researcher should take the role of the disinterested observer in modern post-positivist scientific thought (Popper, 1959). The researcher should have no

vested interest in whether the research turns out one way or the other (Guba & Lincoln, 1994). A good definition of falsification is:

> 'All swans are white', one single observation statement, reporting one single observation of a black swan, allows us logically to derive the statement 'Not all swans are white'. In this important logical sense empirical generalisations, though not verifiable, are falsifiable. This means that scientific laws are testable in spite of being unprovable: they can be tested by systematic attempts to refute. (Magee, 1986: 22-23)

## 4.5 Data collection

Three forms of data were collected in this research; the first was quantitative data in the form of raw SATs (Standardised Attainment Tests) scores and levels attained in assessed written work. The second set of data was the opinions of the participants (the children) which were collected in the form of questionnaires and thirdly selective interviews and anecdotal evidence recorded by me as field notes, the collection of data is indicated on table 4.2 below:

### Table 4.2 Data collection and data analysis process

N= whole class        n= sample

| Data collection | SATs teacher assessment (TA) N | VAK N | Spy questionna-ire n=18 | Interviews about spies n=7 | Metacognition questionnaire N |
|---|---|---|---|---|---|
| Data analysis | SATs papers marked and analysed, Deputy Head validated. | Online analysis | Quantitative thematic analysis | Qualitative thematic analysis | Qualitative coded analysis by researcher |
| Cycle 1 | September 2009 July 2010 | Sept 2009 July 2010 | February 2009 | May 2010 | N/A |
| Cycle 2 | September 2010 July 2011 | Sept 2010 July 2011 | January 2010 | June 2011 | June 2010 |

It should be remembered that there is not always a clear distinction between qualitative and quantitative data:

> It is artificial to describe research as qualitative or quantitative. Studies often include both dimensions. However, for the purposes of this paper/series, this distinction is drawn for clarity of writing. (Botti and Endacott, 2005: 187)

There are four[13] principles that guide quantitative data collection; these are:

- Empiricism, observation and measurement that can be replicated by others.

- Measurement, careful explanation of the scales tools or devices used.

- Replicability, to ensure that the results gained can be replicated by others.

- Objectivity, the researcher, must strive to eliminate any bias in the way that data are collected or interpreted.

Researcher bias could have occurred at any one of several stages in the context of this research. For example, when selecting students for interview, I could have selected the best performing children. Another example of when bias could have occurred is in the design of questionnaires. I could have devised questions and ordered them in such a way as to guide children towards the response that I might have wanted.

I wanted to measure the amount of improvement over an academic year. To do this, the children were baseline tested, which means that they were assessed against the levels set out in the National Curriculum for story writing in September. To measure the amount of progress, the children were then retested at the end of the academic year; the difference between the two grades would show the amount of improvement made. The expected amount of improvement was taken as the amount of progress made by children in the national average, which is two parts of a level in the junior years. An explanation is given here; a more thorough explanation is given in Appendix 13:

> Expected progress is a measure of school performance across a key stage. For expected progress to be achieved the pupil must progress through two National

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[13] Four principles taken from Botti and Endacott, 2005.

Curriculum levels between the end of Key Stage 1 and the end of Key Stage 2. Although schools may use key stage sub-levels, a pupil at any sub-level of Key Stage 2 (2a, 2b or 2c) who reached Level 4 at the end of that key stage would be deemed to have made the expected progress. This is because National Curriculum tests and assessments are used to define whole levels rather than sub-levels. (Ofsted, 2013: 8)

The quantitative data that was collected was:

- The improvement made by all individuals in the class over a year in terms of their scores against the National Curriculum levels,

- The number of pupils making different amounts of progress, for example, 2 or 3 parts of a level.

- The average improvement of each ability level group.

- The amount of improvement compared to the learning style of children.

An advantage (in terms of data collection) of case study research is that case studies operate within a limited, narrow band or focus. One of the main reasons for restricting the range or scope of the research is that it helps with the construction of detailed, in-depth understanding of what is to be studied. The direct experiences of individuals can be explored and reported. Though there are other advantages of this type of research, perhaps one other is important in terms of the methodology used in this particular case:

A combination of the other five factors means that case studies are fertile grounds for conceptual and theoretical development. Existing theories can be brought up against complex realities, and the very richness of the data can help generate new thinking and new ideas. (Hodkinson and Hodkinson, 2001: 7)

Problems associated with this form of research include the generation of too much data: so much that they can be difficult to analyse. That did not happen in the case of this research. Perhaps that was because the study involved only two classes (N=57), and the study was narrowly defined.

An issue that resulted from this study was the reliability of the data collected. The small sample of data generated indicated a certain set of findings, but due to the small nature of the set of data, these could be dismissed:

> Quite apart from the sorts of weakness that are often found in case study research, there is a further problem if they present issues or findings that are unpopular, for example with policy makers or managers. Those who do not like what case study researchers write can easily find reasons to dismiss those findings: the sample was too small; it's not like that elsewhere; the researchers were biased, etc. The sorts of research based on large representative samples, with apparently clear, unambiguous findings, are much less easy to resist. (Hodkinson and Hodkinson, 2001:10)

That objection could be countered by the nature of claims made. When drawing conclusions from the data, I had to bear in mind that this was a case study and that I could not claim to have found 'universal truths.' Case study research can, however, discover provisional truths, which might then warrant further investigation.

The method used for collection of the SATs results was straightforward, and results were taken as a whole. Teacher bias was wholly eliminated because the marking of papers and overall level given was by an external examiner. The SATs results can be taken as being as objective as it is possible to get in terms of levelling the performance of children in a class. The SATs results are included in the data in chapter five. The SATs results are intended for comparison only because the question in the SATs could not be relied upon to be a story. I could not take the SATs score to use directly, and so, teacher assessment was used, which was based on an earlier SATs paper that contained a story question. The use of the SATs scores was to act as a measure of teacher bias. If I favoured child A, and awarded him or her 5a, this could be cross checked with their SATs score, if this was also 5a then bias could be eliminated.

The base line test was given in September to each of the classes involved in the study. There was more room for teacher bias in this test because the test was administered and marked by me, the class teacher. Bias was reduced because the story was given so early in the year that I hardly knew the children. Being human, however, there was always the potential for bias, and so the assessment was validated ad moderated by a colleague. Moderation is:

> … ongoing assessment – teachers are making professional judgements on their children's attainment and progress. (Standards and Testing Agency, 2013: 4)

Due to time limits, not every script (story written in the test) was moderated, a cross sample of five were checked, and the average difference applied to the other scripts.

A range of qualitative data could be collected by the researcher, but what is important is whether the data is the best to use:

> The qualitative researcher is able to use a variety of techniques for gathering information. There is no single prescription for which data collection instruments to use; rather the issue here is of 'fitness for purpose'. (Cohen *et al.*, 2007: 181)

Some instruments were used more than others, questionnaires were used, one to discover the learning style of the children, and a second to find the level of metacognitive level of the children. As well as questionnaires, anecdotal evidence was taken in the form of 'field notes,' in other words, what was said in class. There were also a small number of interviews conducted.

The nature of the data to be collected was determined by the research questions. To answer research questions one, two and three, I needed two forms of data: the SATs results of the children and VAK questionnaires. The best tool to use to answer RQ4 and RQ5 was a questionnaire supported by interviews to triangulate the findings of the results.

Wherever possible, data collection involved the whole class. There were a number of reasons for collecting the data from every child; one was the small number of participants (N=57); secondly, collecting data from every child eliminated bias and ensured impartiality. I was not able to collect data from the whole class when I held interviews. In this instance, I chose seven children at random.

Other data could perhaps have been collected, but this can be a potential problem for the

researcher:

> Although the opportunity to gather data from various sources is extremely attractive because of the rigor that can be associated with this approach, there are dangers. One of them is the collection of overwhelming amounts of data that require management and analysis. Often, researchers find themselves "lost" in the data. (Baxter and Jack, 2008: 554)

I limited the data collection for that reason. It would have been easy to become overwhelmed by the data themselves; as a result, I collected just what I deemed to be essential.

### 4.6 Questionnaires and interviews

This research uses the work, effort and results of children. As it was important in terms of Pupil Voice to ask them for their opinions. The children were asked to give their input and feedback about their experience and opinion of all of the kinaesthetic activities in which they were involved. When conducting research today, the researcher has a range of options open to them when asking for the opinions of participants in research. The views of the respondents might be taped, filmed or written; all of these formats would then be available for future analysis and review:

> It is clear that spoken and written language make somewhat different demands on language producers. (Brown and Yule, 1983: 4)

When speaking, the speaker controls the production of communication that is different from those controlled by the writer. The speaker must monitor what has been said, and whether it matches their intentions, and while speaking, they must plan their next sentence. The disadvantage is that the speaker has no written record of what they have said, and so cannot refer to it. The writer, on the contrary, may look back at what has been written and may pause between each word without fear of interruption. The writer may also spend time choosing their next word, use a dictionary, check progress or change their mind about what they have written:

> Whereas the speaker is under considerable pressure to keep talking during the period allotted to him, the writer is characteristically under no such pressure. Whereas the speaker knows that any words which pass his lips will be heard by

the interlocutor and if they are not what he intends, he will have to undertake active, public 'repair'. The writer can cross out and rewrite in the privacy of his study. (Brown and Yule, 1983: 5)

Due to the need for analysis and the relative advantages/ disadvantages of the written and spoken format, I decided that the children should be asked for their opinions in the form of a questionnaire. The purpose of the questionnaire had to be ascertained before the children were presented with it and asked to complete it. There are several types of questionnaires the advantages and limitations of which are discussed briefly below.

In general, the larger the sample of the questionnaire, the more structured closed and numerical the questionnaire might have to be. A pilot version may be required to use a closed structured questionnaire, which might need to be developed to a point at which the finished version contains the full range of possible responses. Once set up the analysis can be very rapid, which is a great advantage and statistics might be used when processing the data. Unstructured questionnaires are more open but instead of the range of responses being limited, respondents to unstructured questionnaires can comment as they think best and as fully as they desire:

> There is a clear structure, sequence and focus, but the format is open-ended, enabling respondents to reply in their terms. The semi-structured questionnaire sets the agenda but does not presuppose the nature of the response. (Cohen *et al.* 2007:320)

There are several types of questions including multiple choice, dichotomous questions, ratio data and open-ended questions. As stated in the above, closed questions that are highly structured because they can generate data that can be analysed by statistics, they enable cross group analysis and are quickly analysed. Open-ended questions are useful where the range of possible answers is unknown:

> Open ended questions are useful if the possible answers are unknown or the questionnaire is exploratory, or if there are so many possible categories of response that a closed question would contain an extremely long list of options. (Bailey, 1994: 120)

Closed questions, such as multiple choice or rating scales are quicker to analyse and to derive data from. They also have the advantage of not being dependent on how

articulate the respondents are. Closed questions are, however, limited in that they do not allow respondents to add remarks or explanations to the choices they have made:

> Open questions enable participants to write a free account in their own terms, to explain and qualify their responses and avoid the limitations of pre-set categories of response. On the other hand, open questions can lead to irrelevant and redundant information. (Cohen *et al.*, 2007: 321)

Another limitation of open-ended questions is that they are not as easily or as quickly analysed and that they are not as amenable to statistical analysis.

The major advantage of this type of response is that it forces the respondent to 'come off the fence' on an issue. The respondent does not have the choice of remaining neutral nor non-committal. The response choice is closed, either yes/no, the results are also quickly analysed and can provide statistical data if so required. This type of question might also be used to 'funnel' respondents if you answered no, please go to question X. A major problem with this type of question is that:

> It is a natural human tendency to agree with a statement rather than to disagree with it; this suggests that a simple dichotomous question might build in respondent bias. (Youngman, 1984: 163)

Multiple choice questions can be designed to give the likely range of options to the question asked. I give the example of the likely choices to a new chemistry scheme by Cohen *et al.* (2007: 323).

The New Intermediate Chemistry Education (NICE) is:

a) A waste of time

b) An extra burden on teachers

c) Not appropriate for our school

d) A useful complementary scheme

e) A useful core scheme throughout the school

f) Well-presented and practicable

When designing this type of questionnaire, care must be taken to ensure that there is no overlap of choices, that they are discrete in nature. This type of questionnaire would also need guidance to be given to the respondents, for example, tick one box.

An advantage of this form of the questionnaire is that the data are quickly analysed and might be statistically analysed. A disadvantage is that it affords little more than a crude statistic. In the case of the chemistry scheme above, some of the terms might also be ambiguous, especially terms such as 'burden', 'appropriate', and 'useful'. Respondents might have interpreted these very differently making the data erroneous or ambiguous. As well as a few other problems, multiple choice questions are also liable to have problems with their word order and statement order.

This type of questionnaire is very similar to multiple choice, but moves on one step and requires the respondent to prioritise. As a result, the respondent can provide a degree of preference and priority when giving their response. The question typically requires the respondent to place a number 1 next to their preferred choice, two next to their second preference and so on. This form of the question was considered to be too limiting for the purposes of this research; the main problem being that respondents could not explain what they meant:

> The open-ended question is a very attractive device for smaller scale research or for those sections of a questionnaire that invite an honest, personal comment from respondents in addition to ticking numbers and boxes. (Cohen *et al.*, 2007: 330)

Questionnaires put open-ended questions then leave a space for the respondents to answer, enabling them to leave a free response that can be as full (within reason) as they wish to leave. The advantage of this type of questionnaire is that the answers might contain 'gems' of information that might otherwise not be caught in the questionnaire.

This type of questionnaire often requires some support for the respondents, so that they are aware of the type of reply being sought. Open-ended questions can catch authentic responses in more detail than other types of questionnaire, such as those involving closed questions, as argued below:

> An open-ended question can catch the authenticity, richness, depth of response, honesty and candour. (Cohen *et al.*, 2007: 330)

Open-ended questions present both limitations and problems, as mentioned elsewhere: that of the problem of data handling. An example of this would be if one wanted to convert the opinions into numbers, then the questionnaire should have originally used rating scales. It could be argued that if the researcher tried to analyse word-based data statistically, they would be mixing paradigms, mixing quantitative positivist methodology with qualitative interpretive methodology. There are other possible problems, including the time taken to complete open-ended questionnaires. The nature of the questionnaire might cause the respondents to overlook the instructions; as they are engaged in the more difficult and challenging task of writing their more lengthy responses.

The order in which questions are presented is important, as often the first few questions can determine how the rest of the questionnaire is to be answered:

> The ordering of the questionnaire is important, for early questions may set the tone or the mind-set of the respondent to later questions. For example, a questionnaire that makes a respondent irritated or angry early on is unlikely to have managed to enable the respondent's irritation or anger to subside by the end of the questionnaire. (Cohen *et al.*, 2007: 336)

A problem is that a respondent might read the signs when completing the questionnaire; early responses might influence later ones; they might seek to answer in a similar way, or indeed differently. They might also prefer to choose items that appear earlier in a list of choices rather than those which appear later in the list. The key principle is to avoid creating a mind-set early on in the questionnaire:

> Completing a questionnaire can be seen as a learning process in which respondents become more at home with the tasks they proceed. Initial questions should therefore be simple, have high interest value, and encourage participation. This will build up confidence and motivation of the respondents. (Cohen *et al.* 2007: 337)

The initial questions should be straight forward and simple, followed by the middle questions that might be more difficult, and the latter that encourage respondents to

complete the schedule. These might seek to ask the respondents for their opinions, attitudes, perceptions and views.

An interview was defined in an earlier work as:

> A purposeful conversation in which one person asks prepared questions (interviewer) and another answers them (respondent). (Frey and Oishi 1995: 1)

An interview is undertaken in order to gain information on a particular topic or a particular area to be researched. An interview can, however, be used in a variety of other ways, such as supporting findings already made in as a result of other forms of data collection. Interviews are a useful endeavour that can lead to other research using different tools, such as observation and experiment. For the purposes of this research, open-ended questions (discussed above) were used.

'Open ended questions allow the interviewer, if they wish, to probe deeper into the initial responses of the respondent to gain a more detailed answer to the question' (Wimmer and Dominick, 1995: 156). Interviews were a small part of this research and were used to triangulate other methods of the research to help to validate the findings.

## 4.7 Triangulation

Triangulation refers to the process by which 'a researcher wants to verify a finding by showing that independent measures of it agree with or, at least, do not contradict it.' (Yeasmin and Rahman, 2012: 155). Triangulation was used in this work to ensure the validity of the findings. The combination of different methods and research tools can be used to 'overcome the weakness or intrinsic biases and the problems that come from single method, single-observer, single-theory studies' (Yeasmin and Rahman, 2012: 157-8).

> There are basically three types of biasness: firstly, the measurement bias is caused by the way in which data are collected; secondly, sampling bias causes as all the population under study are not covered; and thirdly, 'Triangulation' Research Method as the Tool of Social Science Research 158 procedural bias occurs when participants are put under some kind of pressure to provide information. (Yeasmin and Rahman, 2012: 157-8)

Triangulation increases validity by incorporating several viewpoints and methods, it is the combination of two or more theories, data sources, methods or investigators in one study of a single phenomenon to converge on a single construct.

> Triangulation can also be achieved by using different research techniques. Triangulated techniques are helpful for cross-checking and used to provide confirmation and completeness, which brings 'balance' between two or more different types of research. The purpose is to increase the credibility and validity of the results. (Yeasmin and Rahman, 2012: 157)

The reason for the triangulation of results is to obtain conformation of the findings through the convergence of different methods. There are different approaches to triangulation in fact, there are many different approaches to 'triangulation' and there are articulate proponents for each approach. There are four forms of triangulation:

- Data 'triangulation' (retrieve data from a number of different sources to form one body of data).
- Investigator 'triangulation' (using multiple observers instead of a single observer in the form of gathering and interpreting data),
- Theoretical 'triangulation' (using more than theoretical positions in interpreting data).
- Methodological 'triangulation' (using more than one research method or data collection technique).

The last one on the last, methodological triangulation is the most common type of triangulation. The type of 'triangulation' chosen depends on the purpose of a study, and more than one type of 'triangulation' can be used in the same study. It is the type of triangulation used in the present work, it is developed later in chapter 4, section 4.2.

**4.8 Problems and issues encountered whilst conducting this research**

There were a number of problems and issues encountered while conducting this research. Ideally this work would have used 'objective' assessments, such as the end of

year six SATs (Standard Attainment Tests) tests. Unfortunately, there has not been a story question on the SATs for several years. As a result, I had to use a story from a past SATs paper that had a marking scheme. I decided to grade or assess the children at the start of the year and at the end of the year, which would give a measure of the amount of progress made. The SATs grade is also shown for the results to show the overall level of the children and the amount of progress made over the year. Using the SATs grades presented its own set of problems. The child might have had an off day, they might have been ill, or they might have performed better or indeed worse on a different set of questions. The SATs score is for this reason just a snap shot of the child's performance on one test, which may or might not be representative of their ability.

Another potential issue arose when children were asked for their opinions in the form of questionnaires. They might have been tempted to give the answer they thought the teacher wanted (to please the teacher) and not their true opinion. This is called the Hawthorne effect, which is the name of a town where the effect was first noticed. In 1955, Henry Landsberger, performed a study and analysis of data from experiments performed between 1924 and 1932, by Elton Mayo, at the Hawthorne Works near Chicago. The company wanted to find out if the level of light within their building affected the productivity of the workers. Mayo found that the light made no difference, what he discovered was that the workers increased output, simply because they were aware that they were under observation. The conclusion was that the workers felt important because they were pleased to be singled out, and increased productivity as a result. Many types of research use human research subjects, and the Hawthorne effect is an unavoidable bias that the researcher must try to take into account when they analyze the results. It has been defined as:

> the confounding that occurs if experimenters fail to realise how the consequences of subjects' performance affect what the subjects do. (Parsons, 1974: 930)

Earlier, Mayo (1933) argued that the Hawthorne effect is really down to how the workers (in this study, the children), are made to feel because of the sympathy and interest of the observers. In other words, perhaps it is something in the behaviour of the teacher that influences the choices made by the children on the questionnaires. I attempted to address the Hawthorne effect by asking the children to answer a

questionnaire in which the answers were given in a different order. This added a random element to the test that would make it more difficult for the children to remember the answer they had given in the last test.

As with any research, there are issues and problems, where they are identified, they can be considered and their effects on the research can be reduced. Younger respondents especially those, in which there is an uneven power relationship, such as in a classroom situation, might try to please the person giving the questionnaire rather than to answer it honestly. There is also the danger that responses might provide unwanted information, this might be of a sensitive nature, or it might be responses that are negative to the activity. To avoid or at least to reduce these effects, anonymity might be used:

> The cloak of anonymity is often vital in sensitive research, such that respondents are entirely untraceable. (Cohen *et al.* 2007: 126)

I needed to be able to identify pupils as a result of this, I had to be aware of the potential for teacher bias and conduct the study in the professional manner with which I conduct all of my work:

> Researchers should openly acknowledge the influence of prior work or experience on their perspective. (McGhee *et al.*, 2007: 335)

The researcher can have an effect on the data, as such, they must be aware of any such influence. The research complemented my job; I am a professional who is used to marking children's work. I mark the work, not the child, I did not show favour or bias. Where there was an opportuniy for bias, in the selection of pupils to complete interviews, I put all of the children's names in a pot and selected names at random. Research conducted by humans will always be flawed, all that can be done is to attempt to minimise our personal influence on the research process.

Research strives for the 'truth', it attempts to derive new knowledge in doing so; it attempts to be objective. Objectivity is an impossible goal; at best we can strive for an agreed view of how things might be described, Objectivism might be described as:

the basic conviction that there is or must be some permanent, ahistorical matrix or framework to which we can ultimately appeal in determining the nature of rationality, knowledge, truth, reality, goodness, or rightness. (Bernstein, 1983: 8)

I tried to be as objective as I could, but like all researchers, I have beliefs, prejudices and a political stance. This aspect of research has been a problem for positivists for many years. To what extent any research can be truly objective is questionable:

There has always been a problem for empiricism about the way in which observations or data serve as evidence for a theory. (Crasnow, 1993: 194)

Objectivity is also called into question by the selection of data, or other evidence used to support the theory itself:

Observations that scientists make are taken to be evidence for the theory, but which observations? Certainly not all of the observations that might be made in a particular situation. The observations that are relevant to the theory are those that count as evidence. But how can the empiricist specify which observations those might be without appealing to the theory itself? (Crasnow, 1993: 194)

Although the objective search for 'the truth' should be rejected, it does not necessarily mean that we should accept that all things are subjective and relativistic. In his book 'Beyond Objectivism and Relativism', Bernstein discussed the work of Gadamer:

All of the themes in Gadamer's philosophical hermeneutics contribute to the movement beyond objectivism and relativism. Gadamer is not simply attempting to reveal what happens when we 'understand' in some limited and parochial sense of understanding. If we are truly dialogical beings- always in conversation, always in the process of understanding-then the dynamics of play of understanding underlie and pervade all human activities. (Bernstein, 1983: 167)

The issue of objectivity and relativism impacts the present research, in particular through what has come to be called 'Rosenthal's Pygmalion effect. The Pygmalion effect is defined as:

If teachers were led to expect enhanced performance from some of the children then they did indeed show that enhancement, which in some cases was about twice that showed by other children in the same class. (Draper, 2002: 8)

Rosenthal and Jacobson (1966) conducted a study at a primary school, called Oak school. Teachers were deceived into believing that 205 of their class were more intelligent as defined by an IQ test, and as a result were expected to develop more quickly than the rest. The group had been randomly selected from the class and was not necessarily the best performing or those progressing the strongest:

> In fact, this set was randomly selected, or rather, selected by stratified random sampling, the better to guarantee that they were extremely similar in both mean and variation to the rest of the class. The main measure was a kind of IQ test, administered at the start of the school year. (Draper, 2002: 8)

Having derived the claimed learning style of the children, I might have inadvertently influenced their learning by believing that a certain learning style indicated a higher level of intelligence than others.

Interviews were carried out in lesson time, whenever I could accommodate them in the tight schedule. I found it difficult at times to focus in the question whilst being in charge of the class. I needed to keep one eye on what the class were doing whilst asking questions, as a result, I do not feel that the interviews had one hundred percent of my attention. This led at times to my leading the interviewees in a way that I would have hoped not to had I been able to give it my full attention.

For any research to be valid, it must have something against which the findings can be compared. Ideally this comparison would have been another class in the same school. That would have allowed an experimental design with one class taught kinaesthetically while the other was taught in a different way, using more didactic visual or auditory methods. The two classes could then be compared; any evident differences could be attributed to the teaching methods. If, for example, the class taught kinaesthetically improved more than the other class, it could be deduced that teaching a class kinaesthetically improved the performance of children. However, it could be argued that exclusion from a less kinaesthetic programme could potentially harm the study class, from my experience I was sure that would not be the case.

All universities have similar ethical guidance on this matter; the guidelines on ethical matters are there to protect the study group or individuals and the researcher themselves. Anglia Ruskin's guidelines are as follows:

> You must endeavour to protect research participants from physical and psychological harm at all times during the investigation. (Research Ethics: Anglia Ruskin University. 2013:10)

## 4.9 Ethical considerations

There are a number of common concerns when considering the ethical factors involved in research.

> Common concerns dominate aspects of ethics in research. Informants should enter projects voluntarily, and understand the nature of dangers and obligations. (Bogdan and Biklen, 2007:48)
>
> Ethical planning should be included in the thesis planning at the earliest possible stage, if you are planning research involving or relating to human participants, you are advised to consider ethical issues at the earliest possible stage in the planning and writing of your proposal. (Research Ethics: Anglia Ruskin University, 2013:85)

Ethical considerations concerned the children and the researcher; I had to ensure that no child was harmed in any way through my carrying out this research. All researchers have beliefs and assumptions; I needed to be aware of how my beliefs might change while conducting the research. I did find that my assumptions and some of my beliefs changed, but not to my detriment, a new belief system began to replace the old set of beliefs about learning styles. All research requires ethical approval, because of a number of factors, including:

> To protect the rights and welfare of participants and minimise the risk of physical and mental discomfort, harm and danger from research procedures. (Anglia Ruskin University Research Student Handbook 2013: 83)

To safe guard the children, I built in an extra level of precaution to protect the identity of each child. I allocated each child a number and a code. At times, I use their number at others their code. The code and the number were kept by me on a secure laptop at my home. It is impossible to identify the children from either the code or the number. This

level of protection ensured that the identity of the children is kept secret and addressed potential problems that might have arisen from the use and publication of the SATs results, teacher assessment and improvement of the children over the year.

Although much more is known now, it was pointed out by Ulichny and Schoener that very little had been published about the role of the researcher and the effect they might have upon the research.

> Relatively little has been written from the standpoint of the researched participant on the nature of relationship and involvement in the research process. Ulichny and Schoener (1996: 498)

There are a number of potential advantages and disadvantages of being both the teacher and researcher. Advantages include almost unlimited work time access to the research group, the ability to direct the research almost at an instant. In other words, if an idea suddenly came to me whilst I was working, I could act on it and collect the data required. Another advantage is that the researcher has the trust of the subjects of the research. There are clearly potential disadvantages of the teacher also being the researcher. Such disadvantages were outlined by Ulichny and Schoener (1996: 501) when they looked at the power relationships between a teacher and someone else who was the researcher. The disadvantages had the potential to cause some teacher discomfort:

- Invasive Design: reflection on this situation led me to a number of insights about the design of participant-observer research. A qualitative single-subject case study of a professional practice can be a very invasive design.

- Doubtful Benefits of the Research to the Informant. The potential benefits of the research to the practitioner are remote, because the ethnographer enters the field without a clear research question and with no prediction about the results of the study. Given the intimate view that the informant permits the researcher, shouldn't the subject expect something positive to emerge from the experience?

- Researcher as Critical Evaluator and the Issue of Trust: The third feature that can lead to teacher discomfort, a feature related to the previous two points, is the fact that the participant observer is obtrusive in the field. In spite of assurances

and precautions to the contrary, the researcher alters the context of the situation by her very presence.

- Power and Knowledge Differential: Finally, perhaps the most critical feature of the teacher-researcher relationship, and the feature underlying all that I have described so far, is the power/knowledge differential between researcher and teacher. Within the dyad, the researcher has more power while the teacher has more knowledge. This creates a contradiction in the research process that requires resolution.

The same issues impacted upon the present work to a greater or lesser degree. To counteract the first and second issues, I attempted to do the research alongside the class work, the research became the children's work, as a result of the invasive nature of the research was reduced to almost negligible. The children did not see me put another hat on, I was able to combine the role of teacher and researcher through the design of the work. The only difference between me and any other teacher was that I sometimes sat with a pad taking notes. This in itself could be invasive, but I always explained what I was doing and the notes were open and the children could read what I had written. The practice of having a pad soon became normal to the children and few if any asked questions. The third point of trust between teacher and researcher is relevant, as mentioned above, in the advantages. To a large degree, I had the trust of the children and they had mine. The fourth point, that of power, was mitigated to some degree by the design of the research and in particular by the interaction of the concepts outlined in chapter two (diagram 2.1). The children were required through Pupil Voice and MoE to voice their opinions, and so they were used to voicing their opinions and trust developed through this practice.

Case study is a narrative, the nature of the case study as a narrative was dealt with best by Stake in an earlier work; 'the researcher, however, must decide. 1. How much to make the report a story; 2. How much to compare with other cases; 3. How much to formalize generalizations or leave such generalizing to readers; 4. How much description of the researcher to include in the report; and 5. Whether or not and how much to protect anonymity' (Stake, 2005: 460).

Research requires ethical approval if it involves: 'human participants (including observation or questionnaires)', (Anglia Ruskin University Research Student Handbook, 2013: 83). Ethical considerations determined how the research should be structured and how teaching should be organised within the school. It was clearly unethical to use the kinaesthetic methods with just the one class in the study and leave the other class out of the activities. Both classes were for this reason involved in the work, but the results and data collection were only taken for my class. The results were not taken for the other class because it would have been difficult for me to gain access as readily to data from the other class. Testing and assessment would have been more difficult to carry out. It would have been difficult for them to have been involved in the qualitative work, questionnaires, surveys and interviews, due to the time constraints of year six. The inclusion of the parallel class would have required a number of class exchanges.

The children were told that they could withdraw from the study at any time. Although they had given their consent, continued consent could not be assumed:

> Even when participants give their informed consent they cannot necessarily be expected to anticipate their feelings about participation. It is important that as part of the induction and informed consent process, participants are reassured that they may withdraw from the research at any time. (Oliver, 2003: 47)

Only one child withdrew, as a result of the objections of his mother. His data are therefore not included in this study, his opinions were not sought and he was not asked to participate in any of the qualitative investigations such as interviews or surveys. He was included in the lessons however, it would have been unethical to have excluded him from the work that the others were doing. No other child objected, and so all of the other children had their opinions and data involved in the work.

Permission was obtained by sending a letter home explaining the objectives of the research. There were two versions of the letter, one directed at the parents and a second, which used more basic language for the benefit of the children. To be included in the research, a permission slip had to be returned to school by both the parents and the children. Examples of parental consent are included in Appendix 14, where two copies have the consent of the parents. I was fortunate to be in a very supportive school and letters were returned very quickly; I had to reissue a small number of letters each year of

the study, but consent from parents and assent from the children were received swiftly. This research was deemed to be higher risk by the Ethics Committee because it involved children under 16. There was a great deal of interest shown by the parents and some excitement by the children at being involved in research. I was given a great deal of support by the parents and children while conducting the work. I shared as many of the findings of the research as I could. I believed that the work would have been impossible without their contribution. As a result of this, they had every right to know what I had found out and where the research was heading. At the end of the second year, I wrote a report for the govenors about the some of the findings to that date and shared them with the parents, to keep them informed.

An important aspect of research, the bedrock upon which the findings are based, is data handling. There are two important issues that must be considered:

- What needs to be done with the data when they have been collected? How will they be processed and analysed?
- How will the results of the analysis be verified, cross-checked and validated?

(Taken from Cohen et al, 2007: 86).

I used qualitative and quantitative data to address the research questions; the use of multiple data sources is a feature of case studies:

> A hallmark of case study research is the use of multiple data sources, a strategy which also enhances data credibility (Patton, 1990; Yin, 2003). Potential data sources may include, but are not limited to: documentation, archival records, interviews, physical artefacts, direct observations, and participant-observation. (Baxter and Jack, 2008: 554)

> It is incumbent upon the case study researchers to draw their data from multiple sources to capture the case under study in its complexity and entirety. (Yazan, 2015: 142)

The analysis of data, cross checking and validation varied according to the data collected. SATs data were collected and VAK questionnaires completed by the children to address the research questions one, two and three. The SATs data collected in September and July were marked by me using the accompanying marking schemes. In

order to check my marking and to ensure impartiality, the Deputy Head then checked a sample of the papers. She re-marked three papers of children who had not scored well, three average and three who had scored well. The papers were randomly chosen by her from around ten in each category. Had the results been markedly different, I would have passed more papers to her to check and I would have adjusted the marks accordingly. Each time the papers were checked, her marking was almost identical to mine, with a variation of no more than 5% on any paper. We discussed a few papers at length, and marks were adjusted accordingly. Also included in the data are the actual SATs grades that the children were awarded. These were marked externally, and so impartiality was guaranteed. The VAK questionnaires were marked online; as a result, they were marked with impartiality. Because the numbers were small, (N=57), I collected and analysed papers from all of the children involved, which also helped to ensure impartiality.

The spy work questionnaires were analysed by me. I collated the answers to the questions and counted which response had the greatest number, so that I could determine what the children thought collectively. These were then used to determine what the children thought of the kinaesthetic teaching used in the research to answer the fourth research question. As with the data collection of the SATs and VAK questionnaires, I sampled 100% of the children involved, apart from the one child whose data was not included. This reduced bias and gained more information to support any findings made. The interviews that were used to triangulate the results were completed by a small group of children who were chosen at random. As stated in 5.5.3, seven children were selected, one declined to take part, so another was chosen. Seven children were randomly selected due to the limitations of time; ideally, I would have interviewed all who were willing. The metacognitive questionnaires used to answer the fifth research question were completed by all of the children in 2010. As with the research instruments used to answer the first three research questions above, this reduced bias and helped to ensure impartiality.

Care must be taken at each stage of the investigative process, for example, there are issues to consider at the early stage of the planning the experimental design. 'Experiments should be designed so that the results and processes are periodically reviewed so as to ensure there are no harmful effects' (Research Ethics: Anglia Ruskin

University, 2008:11). Care must be taken not to harm individuals at each stage, for example, when constructing interviews. Lankshear and Knobel (2006: 202), discussed the ethical considerations when developing good quality interview questions are that they should be unambiguous, non-leading, culturally sensitive and ethically formed. I am confident that in conducting this research, no children were harmed academically, socially or emotionally in any way. On the contrary, I believe that through the methods used, their learning experience was richer than it might have otherwise been.

## 4.10 Summary

In summary, this research is an example of an explanatory case study, for which I collected data that was both qualitative and quantitative. There were a number of problems and issues associated with this work, but wherever possible, they were addressed as they arose. The ethics of this research and their effect on the participants were considered to ensure that any ethical problems that might arise were kept to a minimum. The ethics were considered before the proposal was then subsequently passed by the ethics committee. The findings of the research are now presented in chapter five, evidencing the learning.

# CHAPTER 5

## EVIDENCING THE LEARNING

### 5.1 Introduction

In this chapter I present the results of the research, addressing the research questions. The results are both qualitative and quantitative. The chapter also includes the results of the statistical significance tests which show the validity of the improvement made by the children. The research questions are:

**RQ2:  Can kinaesthetic teaching improve children's attainment?**

**RQ3:  Can the benefits of kinaesthetic teaching be attributed differently according to children's learning styles?**

**RQ4: What is the children's perspective on the kinaesthetic teaching and learning methods?**

**RQ5: What is the role of the metacognitive process in children's learning?**

Research question 1 was discussed in chapter three, subsection 3.5, the first research question asked if children keep the same learning style? It was discussed in chapter three, because the findings supported the arguments against VAK and due to the rejection of VAK as a theory, it was no longer a main research question of this work. The results are organised according to the research questions; they are set out in order, and each is dealt with in turn.

### 5.2 RQ2:  Can kinaesthetic teaching improve children's attainment?

These findings address the third strand of the work, the kinaesthetic strand, they also partly address the first strand, the social strand of the research (see section 1.5). Before the level of improvement can be assessed, a measure of the national average must first be made. The National Literacy Trust is an independent charity that undertook a study of the state of Literacy in Britain as a whole in 2010. Included in the report were the

levels of achievement in Literacy for schools in between the years of 2006 and 2009. The trust found that: 'At Key Stage 2 (age eleven) the percentage of young people achieving the expected levels in reading increased by 8% over ten years, from 78% in 1999 to 86% in 2009' (Jama and Dugdale, 2010:3). The report also reported that there was a similar improvement in the levels of writing attainment: 'The percentage of young people reaching expected levels for writing increased from 54% in 1999 to 67% in 2006. However, from 2006 to 2009 levels levelled off, and the percentage remained the same (67%) three years later' (Jama and Dugdale, 2010:3).

The expected level was also given in the document, measuring progress at Pupil, School and National levels. In the document, it said: 'The expected level at Key Stage 2 is Level 4. 72% of these pupils achieved Level 4 or above in English. In Maths 69% and 83% in Science,' (Measuring progress at Pupil, School and National levels, July 2009: 7) [14]. The results are shown in the table below:

**Table 5.1 Key Stage 2 (levels)**

| English | Number | Attainment Pupils % |
|---|---|---|
| No Prior record | 25,700 | 4% |
| Below 2 | 32,500 | 5% |
| 2 | 5,900 | 1% |
| 3 | 95,300 | 16% |
| 4 | 284,600 | 47% |
| 5+ | 151,300 | 25% |
| Other | 9,800 | 2% |
| Total | 605,100 | 100% |

---

[14] Available at: www.cornwall.gov.uk/media/measuring-Progress-at-pupil-school-and -National-Levels.pdf  page 8, Table 2.1

The same report stated that the expected level at Key Stage Two is level four. 'The expected level at Key Stage 2 is Level 4 and the expected level at Key Stage 4 is grade C at GCSE or equivalent'. (Measuring progress at Pupil, School and National levels, July 2009: 8) As can be seen from Table 5.1, only 25% of children achieved above level 4 in the Key Stage Two English SATs, which is the combined total of reading, writing, spelling and handwriting. Those areas of English made up the final SAT score for English. In 2009, pupils achieving level 4 were distributed as follows: reading (50%), writing (40%), spelling (7%) and handwriting (3%). The nature of the SATs has now changed in 2014 so that reading, spelling and grammar are assessed using an externally marked paper (SAT), but writing is measured using teacher assessment alone.

A child is expected to achieve level 2 at the end of year two and level 4 by the end of year six. Each level has three sublevels, (see table 4.1). Level four, for example, has level 4c, 4b and 4a, level 4c is the lowest and level 4a the highest. In year two the child would be expected to be level 2c or 2b, and achieve 4b by the end of year six. That means that a child has six to seven sublevels to improve in four years. An example of the 6 or 7 sublevels could be a child starting year four as 2b, then progressing to 2a, 3c, 3b, 3a and then on to 4c. Year three is a transition year in which a child is expected to make one sublevel progress. The same is the case with year six, leaving four sublevels in years four and five for a child to improve if they are to achieve level 4b by the end of year six. For a more indepth explanation of levels, see appendix 13.

## 5.2.1 Results of the 2009 class

The fifth column in table 5.2 below shows the amount of progress as recorded by teacher assessment in terms of how many parts of a level each pupil progressed.

**Table 5.2       Results of the 2009 intake**

Group 1

| Pupil | September 2009 T/A | July 2010 T/A | SATs writing results (July 2010) | Difference between September 2009 T/A and July 2010 T/A[15] |
|---|---|---|---|---|
| 2 | 4.7 | 5.7 | 5.7 | + 3 |
| 4 | 4.3 | 5.0 | 5.3 | + 2 |
| 6 | 4.3 | 5.3 | 5.3 | + 3 |
| 10 | 4.7 | 5.7 | 5.7 | + 3 |
| 13 | 4.3 | 5.3 | 5.3 | + 3 |
| 14 | 4.3 | 5.3 | 5.3 | + 3 |
| 21 | 4.7 | 5.7 | 5.7 | + 3 |
| 24 | 4.7 | 5.3 | 5.3 | + 2 |

---

[15] The difference between the two assessments is the September 2010 figure minus the July 2009 figure. The difference shows the amount of improvement made by the child. For example, 4.0 in September subtracted from 4.7 in July 2010 shows a 2 parts of a level improvement. For more explanation see table 4.1

Group 2

| Pupil | September 2009 T/A | July 2010 T/A | SATs writing result (July 2010) | Difference between September 2009 T/A and July 2010 T/A |
|-------|--------------------|---------------|--------------------------------|--------------------------------------------------------|
| 1 | 4.0 | 4.7 | 4.7 | + 2 |
| 8 | 4.0 | 4.7 | 4.7 | + 2 |
| 9 | 4.0 | 4.7 | 4.7 | + 2 |
| 16 | 4.0 | 5.0 | 4.7 | + 3 |
| 19 | 4.0 | 5.0 | 5.0 | + 3 |
| 23 | 4.0 | 5.0 | 4.7 | + 3 |

Group 3

| Pupil | September 2009 T/A | July 2010 T/A | SATs Writing Result (July 2010) | Difference between September 2009 T/A and July 2010 T/A |
|-------|--------------------|---------------|--------------------------------|--------------------------------------------------------|
| 12 | 4.0 | 4.7 | 4.7 | + 2 |
| 17 | 3.7 | 4.3 | 4.3 | + 2 |
| 18 | 4.0 | 4.3 | 4.3 | + 1 |
| 28 | 3.7 | 4.0 | 3.7 | + 1 |
| 29 | 4.0 | 4.7 | 4.7 | + 2 |

Group 4

| Pupil | September 2009 T/A | July 2010 T/A | SATs Writing Result (July 2010) | Difference between September 2009 T/A and July 2010 T/A |
|-------|--------------------|---------------|--------------------------------|---------------------------------------------------------|
| 5     | 3.7                | 4.3           | 4.3                            | + 2                                                     |
| 11    | 4.0                | 4.7           | 4.7                            | + 2                                                     |
| 20    | 4.0                | 4.3           | 4.3                            | + 1                                                     |
| 25    | 3.3                | 4.0           | 4.3                            | + 2                                                     |
| 27    | 3.3                | 4.0           | 4.0                            | + 2                                                     |

Group 5

| Pupil | September 2009 T/A | July 2010 T/A | SATs Writing Result (July 2010) | Difference between September 2009 T/A and July 2010 T/A |
|-------|--------------------|---------------|--------------------------------|---------------------------------------------------------|
| 3     | 2.7                | 3.3           | 3.3                            | + 2                                                     |
| 7     | 3.3                | 4.0           | 4.0                            | + 1                                                     |
| 15    | 1.3                | 2.0           | Not entered                    | + 2                                                     |
| 22    | 1.7                | 3.0           | 3.0                            | + 4                                                     |
| 26    | 2.7                | 3.7           | 3.7                            | + 3                                                     |

These results are for a class of 29, each pupil having given consent for their results to be used for the purposes of this research. One member of the class did not participate, and for the purposes of this research, names have been replaced by numbers, to protect the

identity of participants. The pupils were organised into groups dependent upon their performance at the start of the year, based upon their performance in the year 5 QCA tests. Group one performed best on the tests and group five worst.

It must be remembered that the tables show teacher assessments as well as the SATs levels achieved by the participants involved in the study. It must also be remembered that both are a 'snapshot' of the pupils' performance. The SATs measure performance on a single day, while, for the purposes of this study, the teacher assessments were based upon two single pieces of written work, taken in September and July. The performance of the children might have varied on another day. Teacher assessments were made by the researcher and then validated and subsequently adjusted, having been moderated.

The levels of the National Curriculum rise from level 1 in year one to level 5 in year six; level 6 was not tested in 2009 to 2010. Each level is split into three parts, so for example level 4, the expected level for year six pupils, rises from 4.0 to 4.3 and 4.7. The expected improvement for an average pupil in the infants is one whole level each year and for two parts of a level in the junior years, from year 3 to year 6. Nationally, the average for all pupils is two parts of a level improvement. The results of this study were compared to the national average.

It can be noticed that the amount of improvement made by each participant varied, some have progressed by only 1 part of a level while one has progressed by four parts of a level. The percentage of improvement can be seen in Table 5.3 below.

**Table 5.3 Parts of a level progress made**

| Progress made (parts of a level) | Number of pupils | Per cent |
|---|---|---|
| 4 | 1 | 3.5 |
| 3 | 10 | 34.5 |
| 2 | 13 | 51.7 |
| 1 | 3 | 10.3 |
| 0 | 0 | 0 |

Just over half of the participants progressed to the level expected by the National Curriculum, two parts of a level. Approximately 10% progressed less than the amount expected by the National Curriculum; 38% however progressed more than the two parts of a level achieved by the national average. The 10% who performed less well than the national average (this represents three children), might result from one or all of several factors. It might be that pupils had an off day, they felt ill or were upset, or they may have found the questions unsuitable. They might of course have been less intelligent, socially deprived (from families living below the poverty line) or not as educationally mature as their peers. An interesting investigation would be to compare these results with the amount of improvement with a national average. The national figure for the amount of improvement in a year is not published (but it is assumed to be two parts of a level). A national average from another school or group of schools could have been used to enable such a test.

By analysing the group progress, it can be seen that some groups have performed better than others, as shown in Table 5.4 below.

**Table 5.4 Average improvement of each group**

| Group | QCA test results | Average improvement (Parts of a level). |
|---|---|---|
| 1 | 5.7 , 5.3, 5.3, 5.7, 5.3, 5.3, 5.7, 5.3 | 2.75 |
| 2 | 4.7, 4.7, 4.7, 4.7, 5.0, 4.7 | 2.5 |
| 3 | 4.7, 4.3, 4.3, 3.7, 4.7 | 1.6 |
| 4 | 4.3, 4.7, 4.3, 4.3, 4.0 | 1.8 |
| 5 | 3.3, 4.0, 3.0, 3.7 | 2.6 |

**Figure 5.1 Graph of the results of Table 5.4**
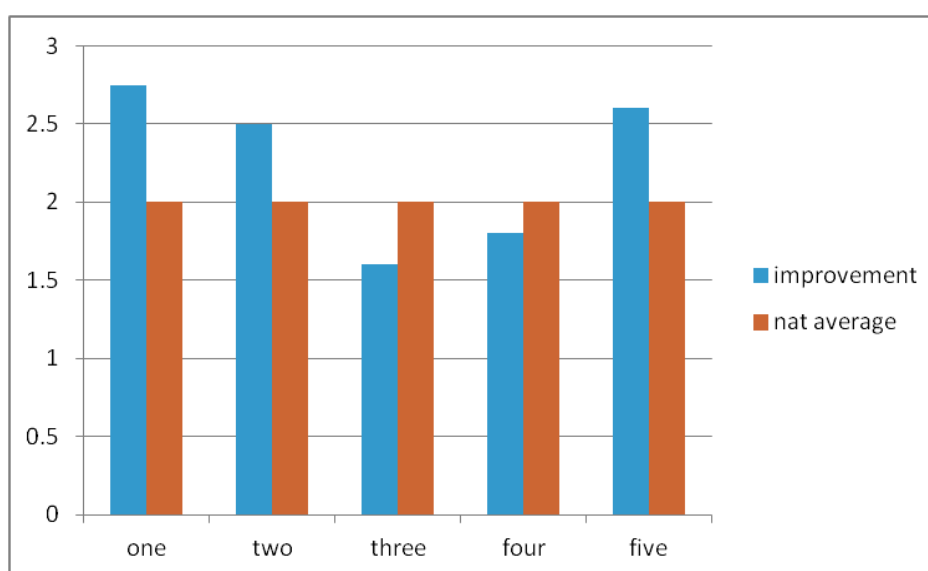


Group 1 were the children who performed better in tests, while group 5 were those that performed less well in tests as measured in September 2008. Group 1 have improved almost three parts of a level; group 2 have also improved more than the expected amount, as have group 5 (children making less than expected progress). Groups 3 and 4 show less than expected improvement, which should be of concern to a classroom teacher and raises a number of questions, including:

- Were these children overlooked?
- Did the teaching and learning style exclude them?

- Did the teaching method use favour the more able?
- Why did the best and lowest achieving groups progress on average more than those that made average progress?

### 5.2.2 Results of the 2010 class

The following table shows the results of the second intake. The 5th column that shows the amount of progress, as recorded by teacher assessment, shows how many parts of a level each pupil progressed. There are three parts to each level of the National Curriculum.

**Table 5.5 Results of the 2010 intake**

Group 1

| Pupil | September 2010 T/A | July 2011 T/A | SATs Writing Results (July 2011) | Difference September 2010 T/A and July 2011 T/A |
|---|---|---|---|---|
| 23 | 5.0 | 5.7 | 5.7 | + 2 |
| 13 | 4.7 | 5.7 | 5.3 | + 3 |
| 10 | 4.3 | 5.3 | 5.3 | + 3 |
| 14 | 5.0 | 5.7 | 5.7 | + 2 |

Group 2

| Pupil | September 2010 T/A | July 2011 T/A | SATs Writing Results (July 2011) | Difference September 2010 T/A and July 2011 T/A |
|---|---|---|---|---|
| 24 | 4.7 | 5.3 | 5.0 | + 2 |
| 20 | 4.3 | 5.3 | 5.3 | + 3 |
| 5 | 4.3 | 5.0 | 5.0 | + 2 |
| 16 | 4.3 | 5.3 | 5.3 | + 3 |
| 21 | 4.0 | 5.0 | 5.0 | + 3 |
| 7 | 4.0 | 5.0 | 4.7 | + 3 |
| 6 | 3.7 | 5.0 | 5.0 | + 4 |

Group 3

| Pupil | September 2010 T/A | July 2011 T/A | SATs Writing Results (July 2011) | Difference September 2010 T/A and July 2011 T/A |
|---|---|---|---|---|
| 27 | 3.7 | 4.7 | 4.7 | + 3 |
| 12 | 4.0 | 4.7 | 4.3 | + 2 |
| 8 | 4.0 | 5.0 | 5.0 | + 3 |
| 11 | 4.3 | 5.0 | 5.0 | + 3 |
| 26 | 4.0 | 5.0 | 5.0 | + 3 |
| 4 | 3.7 | 4.3 | 4.3 | + 2 |
| 1 | 3.3 | 4.0 | 4.0 | + 2 |
| 25 | 3.7 | 4.7 | 4.7 | + 3 |

Group 4

| Pupil | September 2010 T/A | July 2010 T/A | SATs Writing Results (July 2011) | Difference September 2010 T/A and July 2011 T/A |
|---|---|---|---|---|
| 3 | 3.0 | 3.0 | 3.0 | 0 |
| 17 | 3.7 | 5.0 | 5.0 | + 4 |
| 9 | 4.0 | 4.7 | 4.7 | + 2 |
| 19 | 3.3 | 5.0 | 5.0 | + 5 |
| 18 | 3.3 | 4.0 | 4.0 | + 2 |
| 2 | 4.3 | 5.0 | 5.0 | + 2 |
| 15 | 3.3 | 3.7 | 3.7 | + 1 |

Group 5

| Pupil | September 2010 T/A | July 2011 T/A | SATs Writing Results (July 2011) | Difference September 2010 T/A and July 2011 T/A |
|---|---|---|---|---|
| 28 | 3.3 | 4.0 | 4.0 | + 2 |
| 22 | 4.0 | 4.7 | 4.7 | + 2 |

**Table 5.6 Average progress made of each group compared to**

**the national average**

From Table 5.5, the average progress for each group can be calculated as follows:

| Group | QCA test results | Average improvement (parts of a level) |
|---|---|---|
| Group 1 (most able) | 5.7, 5.3, 5.3, 5.7 | 2.5 |
| Group 2 | 5.0, 5.3, 5.0, 5.3, 5.0, 4.7, 5.0 | 2.8 |
| Group 3 | 4.7, 4.3, 5.0, 5.0, 5.0, 4.3, 4.0, 4.7 | 2.5 |
| Group 4 | 3.0, 5.0, 4.7, 5.0, 4.0, 5.0, 3.7 | 2.2 |
| Group 5 | 4.0, 4.7 | 2.0 |

**Figure 5.2 Graph of the results of Table 5.6**
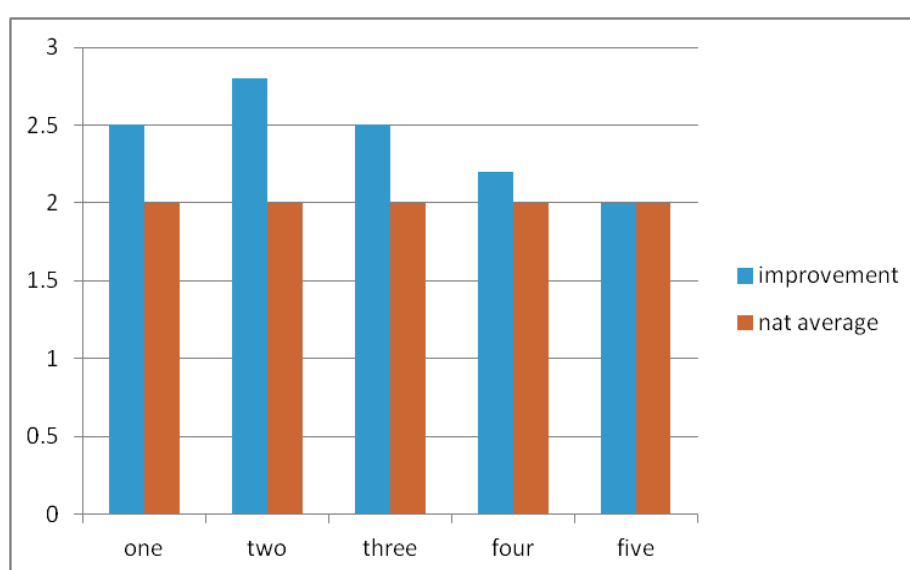


It would appear from the table of results that pupils in group 2 improved more than those in group 5. The difference between group 2 and groups 1 and 3 does not appear to be significant, however. The following table shows the percentage of pupils making progress in terms of the number of parts of a level.

**Table 5.7 Number of pupils showing each level of improvement**

| Progress made (parts of a level) | No. pupils | Percentage (rounded) |
| --- | --- | --- |
| 5 | 1 | 3.5 |
| 4 | 2 | 7.0 |
| 3 | 10 | 35.7 |
| 2 | 13 | 46.4 |
| 1 | 1 | 3.5 |
| 0 | 1 | 3.5 |

Just under half (46.2%) progressed more than expected when compared to the National curriculum expectations of 2 levels. A further 7% or 2 children progressed less than expected, with the remaining 46.4%, making the expected progress. There is a concern, however, those in the more able group one, who appeared to make less progress, could not be assessed at level six. Had it been possible to test them at level six, it might have been found that they had made more progress than it appeared.

Those children who made less than expected progress were 'special needs' children, both being on the Essex register that requires an individual education plan to be written each term. The results show that using kinaesthetic teaching methods does benefit the children. On average, both year groups improved more than the national average.

One question that should be addressed is, does teacher assessment make a difference to the results; in other words, does teacher assessment vary greatly from the actual SATs results?

The diagram below was designed by Merriam (1988). It shows four potential distributions of teacher assessment. Ideally, teacher assessment should be within the distribution shown in b Diagram 5.1.

**Diagram 5.1 Four potential distributions of teacher assessment**
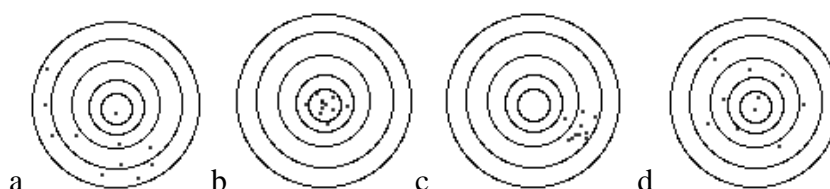


a- not valid, not reliable, which means not accurate and not repeatable.

b- valid and reliable, accurate and repeatable.

c- not valid, reliable, not accurate but repeatable.

d- valid not reliable, accurate but not repeatable.

**Source: Merriam (1988)**

Teaching has been said to be 'holistic, multidimensional, and ever-changing; it is not a single, fixed phenomenon waiting to be discovered, observed, and measured' (Merriam, 1988:167). As such, the assessment of teacher performance is difficult due to the nature of the role. An assessment must, however, be made if the validity of the results is to be assessed. I used teacher assessment as opposed to the SATs levels because of its advantages over a single test taken on one day, and because teacher assessment had to be used for the base line test in September:

> Assessment by teachers has the potential for providing summative information about students' achievement since teachers can build up a picture of students' attainments across the full range of activities and goals. (Harlen 2004: 7)

There are potential problems with teacher assessment as well, as discussed in chapter four. Teacher bias and favouritism, to mention just two of them (as discussed in section 4.5). 'In some national and state assessment systems, in other countries, it has the image of being unreliable and subject to bias', (Harlen 2004: 7).

The sublevels are not shown on the results of the SATs papers returned to schools by the bodies that mark the papers, but with careful analysis they can be deduced. In the writing SATs, level five is achieved with a score of 78%, which leaves 22% divided into three sublevels. This means that 78-85% is 5.0, 86-93% is level 5.3 and 94% and above is 5.7. When the teacher assessment is compared to the SATs results for 2009, teacher assessment is accurate to the exact sublevel in 85.7% of the assessments made. The teacher assessment of the 2010 results was even more accurate, (I checked the accuracy of my assessments) with 92.8% of the sublevels correlating exactly with the SATs results.

## 5.3 RQ3:  Can the benefits of kinaesthetic teaching be attributed differently according to children's learning styles?

These results relate to the third strand of the research, the kinaesthetic strand. The results must now be analysed in relation to preferred learning style expressed by the participants, as shown in the table below. To further ensure anonymity, the pupil coding system of letters and numbers such as 12Ne has been changed to just the number.

**Table 5.8 Level of improvement compared to the learning style**

| Pupil. | The number of parts of a level improvement | Learning style (As claimed in the second survey). |
|---|---|---|
| 4 | 2 | K |
| 13 | 3 | K |
| 24 | 2 | K |
| 25 | 2 | K |
| 5 | 2 | Slight K |
| 6 | 3 | Slight K |
| 10 | 3 | Slight K |
| 14 | 3 | Slight K |
| 17 | 2 | Slight K |
| 18 | 1 | Slight K |
| 22 | 4 | Slight K |

| 29 | 2 | Slight K |
|----|---|----------|
| 11 | 2 | V/R |
| 16 | 3 | V/R |
| 21 | 3 | V/R |
| 26 | 3 | V/R |
| 28 | 1 | V/R |
| 2 | 3 | A |
| 7 | 2 | A |
| 15 | 2 | A |
| 1 | 2 | N/P |
| 3 | 2 | N/P |
| 8 | 2 | N/P |
| 9 | 2 | N/P |
| 12 | 2 | N/P |
| 19 | 3 | N/P |
| 20 | 1 | N/P |
| 23 | 3 | N/P |
| 27 | 2 | N/P |

**Table 5.9 Average improvement of each learning style**

| Learning style | Average improvement |
|----------------|---------------------|
| 1  Kinaesthetic | 2.25 |
| 2  Slight Kinaesthetic | 2.8 |
| 3  All Kinaesthetic (1 and 2) | 2.4 |
| 4  Visual/reading | 2.4 |
| 5  Auditory | 2.3 |
| 6  No preference | 2.1 |

The results from table 5.9 appear to suggest that those children with a slight kinaesthetic preference benefitted more than other groups when taught kinaesthetically. The improvement shown by those with visual/reading learning preference, auditory and those of the combined kinaesthetic group are the same. It would appear that teaching story writing kinaesthetically did not benefit the kinaesthetic learners any more than it did those with a visual learning style. There was however a slight improvement on the auditory learners and those with no learning preference. It should be noted that those with no preference for a learning style improved on average only slightly more than the national average.

### 5.3.1 Results of the progress related to learning style of the 2010 class

The results for 2009 would suggest that teaching story writing using kinaesthetic methods does not benefit one learning style over another, neither does kinaesthetic teaching appear to discriminate against any learning style. Pupils consistently reported that they enjoyed learning kinaesthetically. The average improvement for the class that was 2.3 parts of a level is above that of the national average.

**Table 5.10 Progress made in relation to learning style**

| Pupil. | Number of parts of a level improvement. | Learning style (As claimed in the second survey). |
|---|---|---|
| 27 | 3 | K |
| 9 | 2 | K |
| 5 | 2 | K |
| 1 | 2 | K |
| 2 | 2 | K |
| 13 | 2 | Slight K |
| 12 | 1 | Slight K |
| 3 | 0 | Slight K |
| 18 | 2 | R |
| 21 | 3 | R |

| | | |
|-----|---|-----|
| 25 | 3 | R |
| 14 | 2 | R |
| 22 | 2 | A |
| 20 | 3 | A |
| 23 | 2 | A |
| 19 | 5 | A |
| 17 | 4 | A |
| 8 | 2 | V/A |
| 26 | 1 | V/A |
| 16 | 3 | N/P |
| 7 | 2 | N/P |
| 10 | 3 | N/P |
| 4 | 2 | N/P |
| 15 | 1 | N/P |
| 11 | 2 | N/P |
| 24 | 1 | N/P |
| 28 | 2 | N/P |
| 6 | 4 | N/P |

These results are averaged out in the table below- which shows the amount of progress as an average for those of each learning style.

**Table 5.11 Average progress made for each learning style**

| Learning style | Average progress (parts of a level) |
|----------------|-------------------------------------|
| K | 2.2 |
| Slight K | 1.0 |
| R | 2.5 |
| A | 3.2 |
| V/A | 3.0 |
| N/P | 2.2 |

It would appear that auditory (A) and visual/auditory (V/A) learners progressed more than those with other claimed learning styles. Children with a slight kinaesthetic learning style did not improve significantly (see below), which is not the same as the findings of the 2009 results. The results for 2010 cohort are in keeping with the 2009 cohort because those with a kinaesthetic learning style did not progress more than those with one of the other learning styles. In contrast to the results from the first year, however, it is the auditory learners who have progressed more than other learning styles. In year one, it was those with some kinaesthetic learning who progressed most of all.

## 5.4 Statistical Methods

The statistical analysis was carried out by a professional statistician, Ron Fisher, Ph.D. (Fisher Statistics) at www.FisherStat.com. The main objective of this part of the study was to explore variation in improvement of groups of pupils and with different learning styles. It also aimed to compare the average level of improvement with the national average. The collected data were entered into International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) Statistics 20 to conduct necessary statistical analyses to explore above mentioned research objectives. The statistical analyses were carried out separately for two groups of pupils: 2009 and 2010 pupils. The first choice of statistical methods to test the research questions posed above are Analysis of Variance (ANOVA). ANOVA was used to compare variations of improvement over groups and learning styles and one sample t-test to compare average improvement with the national average.

However, both ANOVA and t-tests are parametric approaches and validity of these methods depends on parametric assumptions. The most important assumption to meet is normality of the dependent variable: the variable being tested should be at least approximately normally distributed. If the assumption of normality is not satisfied, alternative distribution-free nonparametric methods should be used instead. The nonparametric counterparts for ANOVA and one sample t-test are Kruskal-Wallis test and Wilcoxon Signed Rank test respectively.

Statistical analysis was carried out to first test normality of the dependent variable, and then the most appropriate method is decided based on the test results (parametric or nonparametric methods). Kolmogorov-Smirnove test and Shapiro-Wilk test are used to test normality of the dependent variable.

My personal level of understanding of statistics is a passive one. I felt competent to question, interpret and describe the statistical outcomes, but when it was suggested that they might have greater public veracity if carried out by a professional statistician, I took that course of action. Having paid for the analysis, I felt my findings would seem more reliable and therefore my findings would be better supported. I used an approved and publicly acknowledged statistician and paid a respectable fee that ensured that the most up-to-date statistical analyses had been used. The engagement with the statistician served to update my knowledge and understanding before I worked through the results personally to check the internal logic.

### 5.4.1   Testing Normality

Table 5.12 presents the normality test results for the improvement variable for both the intakes: 2009 and 2010. The results show that for both intakes there is significant deviation from normality. The two tests of normality provide uniform results, both rejecting the null hypothesis of normality in the distribution of the improvement variable.

**Table 5.12 Normality test results for the improvement variable for both intakes**

|  | Intake | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
|  |  | Statistic | df | p | Statistic | df | p |
| Improvement | 2009 | .289 | 29 | < .01 | .837 | 29 | < .01 |
| Improvement | 2010 | .234 | 28 | < .01 | .873 | 28 | < .01 |

Evidence of non-normality in distribution of the improvement variable nullifies the appropriateness of parametric approaches (ANOVA and t-test) as analysis techniques to explore the considered research queries. Such evidence also leads this analysis to utilize nonparametric statistical methods.

### 5.4.2 Examining Improvement of Groups and Learning Styles

Kruskal-Wallis tests examining variations in improvement over groups of students are presented in Table 5.13 for both intakes: 2009 and 2010.

Table 5.13 shows that among the 2009 intake, highest average improvement (2.75) is exhibited by the more able children (Group 1), and lowest average improvement is observed for pupils in Group 3. The children in the lowest performing group (Group 5) improved next highest to Group 1.

Variation in the average improvement of the five groups is found statistically significant, $\chi^2(4) = 12.45$, p < .05 implying that pupils in Group 1, 5 and 2 improved significantly better than others. However, variations in the average improvement over groups is not found statistically significant, $\chi^2(4) = 3.32$, p > .05 for 2010 intake pupils.

For this intake of pupils, highest average improvement is found for Group 2 (2.86), and least average improvement is observed for Group 5 (2.00).

All groups improved, there was no significant difference between improvement across the groups.

**Table 5.13 Kruskal-Wallis test results for variation in improvement**

**of ability groups**

| Intake | Group | N | Mean | Std. Deviation | Kruskal-Wallis Test Result |
|--------|-------|---|------|----------------|----------------------------|
| 2009 | Group 1 | 8 | 2.75 | .46 | $\chi^2(4) = 12.45$, p < .05 |
| | Group 2 | 6 | 2.50 | .55 | |
| | Group 3 | 5 | 1.60 | .55 | |
| | Group 4 | 5 | 1.80 | .45 | |
| | Group 5 | 5 | 2.60 | .89 | |
| 2010 | Group 1 | 4 | 2.50 | .58 | $\chi^2(4) = 3.32$, p > .05 |
| | Group 2 | 7 | 2.86 | .69 | |
| | Group 3 | 8 | 2.50 | .53 | |
| | Group 4 | 7 | 2.29 | 1.70 | |
| | Group 5 | 2 | 2.00 | .00 | |

The statistical test results examining variations in improvement over learning styles of pupils are presented in Table 5.14. The results show that average improvement varied significantly with learning styles (2009 intake: $\chi^2(4) = 1.485$, p < .05 & 2010 intake: $\chi^2(5) = 4.60$, p < .05). For 2009 intake, maximum average improvement is observed with learning style pupils exhibit slight Kinaesthetic (Slight K) and minimum average improvement with no preference (N/P) of learning style. However, 2010 intake of pupils show Auditory (A) learning style as yielding highest average improvement and Slight Kinaesthetic (Slight K) as least yielding.

**Table 5.14 Kruskal-Wallis test results for variation in improvement over learning styles**

| Intake | Learning Style | N | Mean | Std. Deviation | Kruskal-Wallis Test Result |
|--------|----------------|---|------|----------------|----------------------------|
| 2009 | K | 4 | 2.25 | .50 | $\chi^2(4) = 1.485$, p < .05 |
| | Slight K | 8 | 2.50 | .93 | |
| | A | 3 | 2.33 | .58 | |
| | V/R | 5 | 2.40 | .89 | |
| | N/P | 9 | 2.11 | .60 | |
| 2010 | K | 5 | 2.20 | .45 | $\chi^2(5) = 4.60$, p < .05 |
| | Slight K | 3 | 1.67 | 1.53 | |
| | R | 4 | 2.50 | .58 | |
| | A | 5 | 3.20 | 1.30 | |
| | V/A | 2 | 3.00 | .00 | |
| | N/P | 9 | 2.44 | .88 | |

### 5.4.3 Improvement compared to the National Average

In this section, the average improvement of pupils of two intakes: 2009 & 2010, are compared with corresponding national averages using Wilcoxon Signed Rank test. Results are presented in Table 5.15. Average improvement for 2009 intake pupils is observed as 2.31 and found as significantly higher than respectively national average (2), p < .05. There is a similar finding for 2010 intake pupils. The average improvement in this intake is observed as 2.50 and is significantly higher than respectively national

average (2), p < .05. In other words, both year groups achieved statistically significantly higher results than the national average.

**Table 5.15 Wilcoxon Signed Rank results comparing improvements with national average values for both intakes**

|  | Intake | N | Mean | Std. Deviation | National Average | Wilcoxon Signed Rank Test |
|---|---|---|---|---|---|---|
| Improvement | 2009 | 29 | 2.31 | .71 | 2 | p < .05 |
| Improvement | 2010 | 28 | 2.50 | .96 | 2 | p < .05 |

### 5.4.4 Conclusion of statistical analysis

This analysis examined average improvements of pupils of two different intakes over pupil groups and learning styles. Also, the average improvement for the intakes are compared with respective national averages. As the analysis variable (improvement) deviated from the normal distribution, nonparametric methods: Kruskal-Wallis test and Wilcoxon Signed Rank test, are used for these comparisons. The average improvement for both intakes is found to be significantly higher than the respective national averages.

### 5.5 RQ4: What is the children's perspective on the kinaesthetic teaching and learning methods?

### 5.5.1 Questionnaire results

This question relates to the second strand of the research, the cognitive processes. The purpose of the questionnaire was to derive the opinions of the children who had been exposed to the kinaesthetic teaching methods. Their responses and opinions were asked regarding one activity, a piece of work that took several days to prepare for; this involved them becoming 'spies' for the week. Pupils were invited to complete the

questionnaire, an example of which is shown in Appendix two, but they were not coerced into doing so. The questionnaires were completed at a very busy time. Some children did not have time to complete them, and so the number of respondents was only eighteen, out of a possible total of 29. Ideally, the sample size would have been greater than this, as argued by Cohen and colleagues. 'Generally speaking, the larger the sample, the better, as this not only gives greater reliability but also enables more sophisticated statistics to be used.' (Cohen et al., 2007: 101). The number that makes the correct sample size is open to debate. Authorities do not always agree, but 'a sample size of thirty is held by many to be the minimum number of cases' (Cohen et al., 2007: 101).

### 5.5.2 Results analysis of responses

The questionnaires were developed for the spy activity. I had intended to develop more questionnaires for the children to respond to the murder mystery (Appendix seven) and the Warhammer game (Appendix eight). Unfortunately, a busy teaching schedule prevented this and I felt I had to prioritise work needs over my personal research needs. When we did have time, I felt that it was too long after the work to ask pupils questions. They might not have remembered all of the idiosyncrasies of the work, their feelings, the excitement or the details.

### Table 5.16 Results of the questionnaire about the spy work

Question 1- What do you remember about the spy work?

| Response | Number | Percentage |
|---|---|---|
| Being out of the classroom | 2 | 8.0 |
| Not being caught by the teachers | 10 | 40.0 |
| Code cracking | 11 | 44.0 |
| Going to the woods | 2 | 8.0 |

Question 2- What was it like being a spy?

| Response | Number | Percentage |
|---|---|---|
| It was exciting | 7 | 33.0 |
| It was like being a spy | 1 | 4.8 |
| Enjoyable/ lots of fun | 9 | 43.0 |
| I had a warm feeling inside | 1 | 4.8 |
| An amazing experience | 1 | 4.8 |
| Hard/ challenging | 2 | 9.5 |

Question 3- What did you like best?

| Response | Number | Percentage |
|---|---|---|
| Sneaking | 5 | 22.7 |
| Code cracking | 12 | 54.7 |
| Not being caught | 1 | 4.5 |
| Everything about being a spy | 1 | 4.5 |
| Tension in the activity | 2 | 9.0 |
| Not doing work | 1 | 4.5 |

Question 4- Do you remember why we did the spy work?

| Response | Number | Percentage |
|---|---|---|
| To learn about being spies/ to experience it | 5 | 22.7 |
| To help us to write | 14 | 63.6 |
| To bring emotions into the story | 1 | 4.5 |
| To improve tension | 1 | 4.5 |
| To boost imagination | 1 | 4.5 |

Question 5- Did it help you to write?

| Response | Number | Percentage |
|---|---|---|
| Yes | 4 | 22.2 |
| Yes it was my best writing | 2 | 11.1 |
| It helped me a lot | 1 | 5.6 |
| I could include my emotions/ experience | 9 | 50.0 |
| I didn't have just to listen to the teacher | 1 | 5.6 |
| No (it didn't help me to write) | 1 | 5.6 |

Question 6- How did it help you to write?

| Response | Number | Percentage |
|---|---|---|
| I can write it again | 1 | 5 |
| It helped me to get excited about writing | 2 | 10 |
| I understood more about being a spy | 4 | 20 |
| It was more exciting having been through events | 6 | 30 |
| I had a better vocabulary having discussed things at the start | 1 | 5 |
| I could include feelings/ tension | 5 | 25 |
| It didn't help me | 1 | 5 |

Question 7- I could have just talked about spies. Did it help you more to have been a spy? How?

| Response | Number | Percentage |
|---|---|---|
| I felt scared and frightened | 1 | 5 |
| It made me think a lot more | 1 | 5 |
| I could feel the emotions | 5 | 25 |
| I learned more easily by doing it | 2 | 10 |
| It helped my imagination | 3 | 15 |
| Experiencing being a spy improved my writing | 7 | 35 |
| It added realism | 1 | 5 |

The number of respondents was eighteen but the number of responses to a question in some cases exceeds this number. This was because some children used more than one phrase, term or word when responding to the questions. An example would be the following response to question one, 'I remember doing code cracking using a spy wheel. This was very amazing but hard to get past teachers. Also other codes (26So)'. This response was included in the 'Not being caught by the teachers' response as well as the 'code cracking' response. It was included because the child clearly remembered that one aim was not to be caught by teachers and that they had to crack codes with a spy wheel. It can be seen from the responses to question one that all pupils remembered the activity: the work could be seen as a 'memorable event'.

The responses to question two indicate that the students enjoyed the work, 33% of responses identified the work as exciting, and a further 43% identified it as enjoyable or lots of fun. The number of responses was again more than eighteen: this was as a result of some respondents who gave more than one response to the question. The responses showed that the children enjoyed the work.

Some answers were included in two categories to question three, such as the following one, 'dodging teachers and cracking codes. I liked it how you could not get caught, or

you would be sent back'. The main response given was given by just over a half (54%); they enjoyed the code cracking, which was a challenging aspect of the work. The code cracking was challenging because children had to solve a problem. They had to decipher the code, and then progress to the next one elsewhere in the school. One interesting aspect of the code cracking activity was that although it was challenging, it was not necessarily the more academic children who were able to crack the codes the quickest. In some groups, children who found academic work more difficult were better code crackers. This might have been because the more academic children were 'outside their comfort zone.' Alternatively, it might have been that in some cases the children perceived as less academic had skills better suited to code cracking. This proved to be a huge boost to one child, 3Ab who was seen by his peers as less academic. I asked him how it felt to be showing other children how to crack codes and how to use the code wheel. He said, 'now I know how it feels to be smart for once'.

Questions four and five showed that pupils remembered that they were doing the work so that they could experience being a spy and that this would help them to write a story about a spy. One child felt that experiencing being a spy did not help them to write, but most responses, (94.4%), indicated that it did help them to write in some way.

No single approach to writing instruction will meet the needs of all of the students. Also, to some extent, techniques may be effective but have not yet been studied rigorously. There is a real need for more research into adolescent writing interventions that work so that they can be adopted more widely. Research into writing interventions would 'allow administrators and teachers to select the strategies that are most appropriate, whether for whole classrooms, small groups or individual students' (Graham and Perin, 2007:11).

The methods used in this work were kinaesthetic in the main, but clearly included some verbal instruction, and in some cases, visual props were used to support the students' understanding. The use of these three methods of instruction together enriched the experience for the children. Half of the respondents felt that it helped them to include their emotions or their experience, both of which improved the quality of writing.

It has been argued that children should be pre-prepared before they write:

> Pre-writing engages students in activities designed to help them generate or organize ideas for their composition. Engaging adolescents in such activities before they write a first draft improves the quality of their writing. Pre-writing activities include gathering possible information for a paper through reading or developing a visual representation of their ideas before sitting down to write. (Graham and Perin, 2007:18)

This work, in which kinaesthetic methods were used was a method of pre-writing. It had the advantage of not only preparing the children for writing, but it also prevented 'story blocks' where the child did not know what to write next. The authors continue:

> For example, some common pre-writing activities include encouraging group and individual planning before writing, organizing pre-writing ideas, prompting students to plan after providing a brief demonstration of how to do so, or assigning reading material pertinent to a topic and then encouraging students to plan their work in advance. (Graham and Perin, 2007:18)

Being prepared to write had its advantages. The opinions of the pupils show that a brief demonstration might not be necessary. Alternatively, they might instead be allowed to find out for themselves. If the responses given to these questionnaires were found to be more general, pupils might also enjoy their work even more.

The responses to question 6, in which I asked the children how the experience of being a spy had helped them to write, might give an insight into the advantage of kinaesthetic work. Twenty per cent of responses indicated that it was more exciting to write, having been through events such as being a spy, with 30% of responses indicating that they understood more about being a spy. Twenty-five per cent of responses were that they could include more feelings and tension in their writing.

> When I was writing, I could think back to when the guards were after me, I got scared and ran, I wanted to hide, and once they cheated! When I was writing though, I could think about them when they were after me, and I could remember the feelings, I got tingly, and my mouth went dry, so I put that in my story, cause that's how the spy would have felt (23Jw).

A further ten per cent of responses indicated that having been spies themselves and having lived through the experience of the excitement, that they were more excited about the process of writing. One child responded that the work had not helped him to write, but because the questionnaires were anonymous, it did not prove possible to ask the respondent why he or she had answered in this way.

The most frequently encountered response to Question 7 was: that the experience of being a spy improved their writing (35%'). The second most frequent response was 'I could feel the emotions'(25%). Kinaesthetic work, such as that used in this work, makes use of a Mantle of the Expert approach. The advantage of this can best be summarised in the words of one of the children, 'Making it more exciting helps you learn better... because we're doing it ourselves' (24Em).

### 5.5.3 Results of interviews

A small group of children were chosen randomly to take part in the interviews, one who was asked declined, so another child was asked, and was willing to take part. In total, seven children completed the interview; all volunteered, and none was told they had to take part. The pupils were chosen through the process of random sampling. This type of sampling was very convenient, but not convenience sampling where 'researchers simply choose the sample from those to whom they have easy access' (Cohen et al., 2007: 114). The sample of children was made randomly (using names in an open box) so that each child had an equal chance of selection. This was done to ensure that there was no bias and to enable a cross representation of the class. It also ensured that it was not only the most able children who were chosen. Each child was told that they could stop the interview at any time if they wanted to.

To ensure that I captured everything that was said, the interviews were recorded, and played back afterwards to create a written transcript of what was said. The purpose of the interviews was to address RQ4: What did the children think of the teaching and learning methods? I already had the questionnaires, so the interviews were an attempt to triangulate the results. An example of the questionnaire and the responses of one child,

WM1 are given below. I chose to select semi-structured but open questions for the purpose of the interview, because I wanted to find out exactly what the children thought of the work. 'They are directly to the point and deliberately more focused than open-ended questions' (Cohen et al., 2007).

### 5.5.4 Interview with one of the selected children WM1:

Q1. Have you enjoyed any of the work this year?

- WM1: Yes, I really liked the spy stuff and the murder mystery, and I liked the art. I didn't like maths and science is boring.

Q2 Did you enjoy some work more than others?

- WM1: Definitely the spy week that was the best.
- Me: Did you enjoy any other work?
- WM1: I liked art, and maths...
- Me: anything else?
- WM1: I liked the murder mystery, that was almost as good as the spy work and the Warhammer game that we did at the start of the year.
- Me: OK thanks (name used).

Q3 How do you like to learn best?

- WM1: I liked the spy stuff best.
- Me: Sorry, let me put it another way, do you like to sit in class

listening, or do you learn better by doing thing yourself?

- WM: I like doing it best.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- WM1: Yes- especially when I was being a spy, and the guards were there, that was the best.
- Me: Was that the only time you felt like an expert?
- WM1: No, and with the murder, and the game we made at the start of the year

and my art got better.

Q5 Did anything this year help your writing to improve?

- WM1: Yes, doing things myself.
- Me: Can you explain that, can you explain what you mean?
- WM: I found it easier to write after I'd acted it because I could remember what I'd done so I knew what to write next.
- Me: So it helped you with the writer's block?
- WM1: I don't know what that means.
- Me: That's where you find it difficult to write, and you can't think of what to write next. Did you find it easier to write after you'd acted out one of the roles?
- WM1: Yes. I remembered what I'd done, so I knew what came next.

Q6, How did carrying out the activities, help you to write do you think?

- WM1: I don't know.
- Me: Did any of the things we did help you to remember or anything else?
- WM1: Yes, it helped me to remember and helped me to think.
- Me: So could you find a word to explain that further?
- WM1: It helped me to imagine, and it made it real like I was really there.
- Me: Very good, thanks.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- WM1:  ....er
- Me: Do you not understand?
- WM1: No
- Me: When you were acting out a role, did you feel excited, nervous, or scared at any stage?
- WM1: When I had to get past the spies, I got really scared, and they weren't being fair, they came after us and you said they weren't supposed to, and Alex got me...
- Me: So could you explain further how being a spy actually helped you to write your story?

- WM1: No... I don't get you.
- Me: what I mean is, how did it help you to imagine you were there as you said before?
- WM1: I got all tingly, and my hands got sweaty, so when I came to write, I could include all of that, and I knew what to write instead of having to think.

When I set out to interview, I thought that my questions were non-leading and objective. I found it challenging to get the students to address the questions directly. Having read the transcripts of the interviews back several times, I can see that I did lead the pupil. This has been a steep learning curve; I am new to the qualitative research process. I would endeavour to become a more flexible interviewer in future and set out to use more open questions and conduct the interviews when I could give them my full attention.

In answer to questions one and two, all of the seven children said that they enjoyed some of the work that they had done in the past year. All of them singled out the spy work and went on to mention other kinaesthetic work, including the murder mystery and the Warhammer role playing game. This was reinforced by the responses to question three in which all seven said that they preferred to learn by doing things for themselves, instead of being told what to do or how to do it. The responses to question five were illuminative, all of the children apart from one said that kinaesthetic work helped them to write because they knew what to write next. The answers to question six showed more variety, but, in general, most children mentioned that their imaginations were stimulated.

### 5.6 RQ5: What is the role of metacognitive processes in children's learning?

This question addresses the second strand of the research, the mental processes. Pupils were asked to complete a questionnaire that sought to evaluate the level of metacognition of the children, as well as the mindset. Only one questionnaire was given to the children, and two classes were involved. The number of responses far exceeds the number of children, because there were frequently two choices made to the questions. The pupils' survey was designed to ascertain pupil attitude toward their learning. The

questions are closed in some cases so that they might direct the pupil towards giving an unambiguous answer. The four responses are ordered the same for each question. The first response tends to indicate a student who is not self-reliant. Self-reliance increases with the fourth response, where the pupil not only learnt independently, but also enjoys learning and the challenge of learning. The questions on the pupil survey are shown in Appendix 12.

Closed questions were chosen for this survey because I wanted to direct responses. There are advantages to the use of closed questions, such as:

> Highly structured, closed questions are useful in that they can generate frequencies of responses amenable to statistical treatment and analysis. (Cohen et al., 2007: 321)

There are several other advantages as well, 'they are quicker to code up and analyse than word-based data,' (Bailey, 1994:118). For the purposes of this survey, the final advantage was perhaps the most compelling. By using closed questions in this survey, they 'enable comparisons to be made across groups in the sample' (Oppenheim, 1992: 115).

Below is a table of the results of the surveys. The results presented in Table 5.17 categorises responses according to student's levels of ability. Level three children who found work challenging tended to respond to the questions with the second response, while those who reached level four, tended to respond with choices two and three. Level four children made the choice of response one at a similar rate as level three students, but the percentage of choice one was smaller than that of the level three students. Children who were assessed as level five, rarely selected choice one, in fact only 2 out of 158 responses were for choice one. The choices increased so that there were over twice as many choice four as there were choice 2. The results are presented below, where the assessed level of the children is shown against the choice of question they made. The results are presented firstly as numbers of choices made, then as percentages of number choices made.

**Table 5.17 Results of pupil choices made in relation to National curriculum levels**

|          | Level 3 | Level 4 | Level 5 |
|----------|---------|---------|---------|
| Choice 1 | 17      | 7       | 2       |
| Choice 2 | 43      | 33      | 21      |
| Choice 3 | 24      | 34      | 32      |
| Choice 4 | 16      | 26      | 45      |

**Figure 5.3 Question choices of level 3, 4 and 5 children**
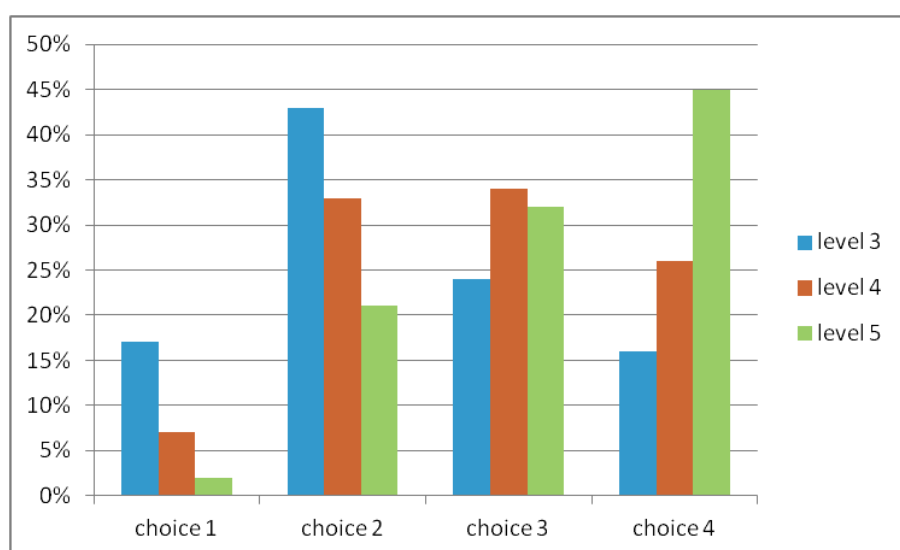


**5.7 Summary**

The results suggest that students who are metacognitive with a growth mind set, as indicated by their selection of choices three and four, were assessed as having achieved higher levels of the National Curriculum. This research is merely a case study, as such, it can only suggest a trend. 'Case studies strive to portray 'what it is like' to be in a particular situation' (Geertz, 1973). It must be remembered that case studies such as this research:

are set in temporal, geographical, organizational, institutional and other contexts that enable boundaries to be drawn around the case; and they can be defined with reference to characteristics defined by individuals and groups involved; and they can be defined by participants' roles and functions in the case. (Hitchcock and Hughes, 1995: 319)

I cannot overstate the claims from this set of results. I can say that they tend to indicate that more metacognitive students achieved higher assessments in tests performed by members of the teaching staff than those who were deemed to be less metacognitive. The findings do however appear to support the findings of Hartman (1998) quoted in Chapter two. Hartman found that those who were more metacognitive acquired and applied what was learned more efficiently than those who were less metacognitive:

> Use of metacognition has been demonstrated to be essential to learning. General strategic, metacognitive knowledge and strategies, and domain specific knowledge have been shown to have important roles in thinking and problem solving. (Hartman, 2001: 33)

Kinaesthetic teaching methods were part of a teaching approach that has been shown in this Chapter to raise attainment by between 0.31 and 0.5 parts of a level above the national average attainment. Kinaesthetic methods are just one element of an approach to teaching taken in the present study. It would be impossible to identify the contribution of kinaesthetic teaching methods from other factors at play in the classroom, such as how motivated the children were or the contribution of non-kinaesthetic lessons. In Chapter six, I will discuss the meaning of the findings of the research.

# CHAPTER 6

## UNDERSTANDING THE LEARNING

### 6.1 Introduction

In this chapter, I will discuss the results and the meaning or the significance of the findings. I will address each of the research questions in turn, beginning with the first research question and ending with research question five. This chapter is divided into three sections, the findings, the analysis of the findings and a critical discussion of the findings. The findings presented below are a brief summary of the main findings already presented in detail in chapter five.

## THE FINDINGS

### 6.2 RQ1: Are learning styles consistently chosen by individuals?

The findings of RQ1 were presented in chapter three and were partly discussed there. Please refer back to section 3.5 to review the findings and discussion. To summarise, the findings were that learning styles are not consistently chosen by the children in this study.

### 6.2.1 RQ2: Can kinaesthetic teaching improve children's attainment?

The results of the improvement of the children related to their learning styles are shown in chapter five in table 5.9 for the 2009 results and table 5.11 for the 2010 results. Dividing the children according to their learning style provides a different picture of the performance of the class when compared to the results divided into the ability groups. The results showed that in 2009, the children who as a group performed the best were those with a slight kinaesthetic preference, with an average improvement of 2.8 parts of a level. Those with a visual/reading learning preference performed above the national average with 2.4 parts of a level improvement, auditory learners performed at a similar average level of 2.3 parts of a level improvement. The pupils that performed the worst were those with no learning preference, with an average of 2.1 parts of a level improvement.

The results for 2010 held some surprises when compared to those of 2009; the learning style that performed the best in 2009 performed the least well in 2010. It was a different learning preference that performed the best in 2010, that of the auditory learners. The auditory learners improved by an average of 3.2 parts of a level, which is significantly above the national average of 2 parts of a level. The visual/auditory learners also performed particularly well, with an average improvement of three parts of a level improvement. Those with a single learning style of kinaesthetic learning performed at a similar level to those with the same learning preference in 2009, the improvement being 2.25 and 2.2 respectively. Reading learners outperformed the national average with an average improvement of 2.5 parts of a level, and those with no preference increased by 2.2 parts of a level. The surprise came when the results for the slight kinaesthetic learning preference were checked; they had an average improvement of only 1.0 parts of a level. This was in stark contrast to the results of the previous year, when those with a slight kinaesthetic preference performed the best of all learning styles. Why those with a slight kinaesthetic learning preference should go from being the highest achieving group to the lowest could not be determined, but it might be the result of purely random chance.

### 6.2.2 RQ3: Can the benefits of kinaesthetic teaching be attributed differently according to children's learning styles?

Tables 5.9 and 5.11 show the average improvement of children when they were grouped according to their claimed learning style. The group that improved the most in 2009 was the group with a claimed slight kinaesthetic preference for learning (Table 5.9), whilst in 2010, the learning style that improved the most was the auditory learners. For both years, children who claimed a kinaesthetic learning style were 5th out of six groups in 2009 and 4th out of six groups in 2010.

### 6.2.3 RQ4: What is the children's perspective on the kinaesthetic teaching and learning methods?

Full results can be found in section 5.5. A brief outline of the findings is that 76% identified the spy work as exciting, enjoyable of lots of fun. Almost all, 94.4%, indicated that the work helped them to write, 50% of responses said that they could include more emotions and experience in their writing, and 30% responded that they

understood more about being a spy after the work. Well over half responded that they could remember why we did the work, 63.6% indicated that it helped them to write.

### 6.2.4 RQ5: What is the role of the metacognitive process in children's learning?

This survey consisted of a series of multiple-choice questions with four possible responses, the results are shown in figure 5.4. In each case, answer one was the least metacognitive response and answer five the most metacognitive response. Sixty percent of responses for the less able (level three) were either answer one or two, the two least metacognitive answers. The more able level five children selected answers three or four (indicating the highest level of metacognition) on 77% of occasions.

### ANALYSIS OF THE FINDINGS

### 6.3 RQ2: Can kinaesthetic teaching improve children's attainment?

Analysis of the results of the 2009 intake show that group one is the best performing group and group five (who performed least well), the improvement shows a different pattern from those of the 2010 intake. The results are shown in chapter five, in Table 5.13, the analysis tool used is the Kruskal-Wallis test results for variation in improvement of ability groups. Group one improved significantly more than the national average. Group one had an average improvement of 2.75 parts of a level with a standard deviation of 0.46. Groups two and five also improved more than the national average with averages of 2.50 (standard deviation of 0.55) and 2.60 parts of a level (standard deviation of 0.89) respectively. For ability groups one, two and five in the 2009 group, kinaesthetic work has improved their attainment more than that of the national average. The results for groups three and four however show that these groups did not achieve the national average of two parts of a level improvement.

The results for the 2010 intake showed that as a class, they improved more than the national average. Those in the best performing group, improving 2.50 parts of a level, with a standard deviation (St .Dev) of 0.58. It is unfortunate that in 2009 to 2010, children could not sit the level six tests, or they might have shown even more progress. A child entering year six at the level of 5.3 could only improve one part of a level (to 5.7). If they had taken the level six test, they might have improved from 5.3 to 6.7,

showing four parts of a level improvement. The highest average improvement was for group two, which improved on average 2.86 parts of a level (St. Dev) of 0.69. Group three improved 2.5 parts of a level (St. Dev) 0.53. Group four improved an average of 2.29 parts of a level (St. Dev 1.70). Group five, improved on average two parts of a level (St. Dev 0.00). Each of the standard deviation calculations is from the average of two parts of a level improvement, which was the national average improvement. The Kruskal-Wallis test results for variation was used to test for the significance of the improvement in the results for the 2010 class, the class demonstrated a statistically significant variation of 0.69 from the national average improvement.

In the two years of study and data collection, both classes achieved an average of more than the two parts of a level improvement. In the 2009 results, the Wilcoxon Signed Rank test showed that the average was 2.31 with a standard deviation of 0.71. This means that the children improved significantly when compared to the national average improvement of 2.0 parts of a level. The Wilcoxon Signed Rank test showed that the 2010 class also improved significantly when compared to the national average of 2 parts of a level; the mean was 2.50 with a standard deviation of 0.96. The classes have been shown to be significantly higher achieving than the national average.

### 6.3.1 RQ3: Can the benefits of kinaesthetic teaching be attributed differently according to children's learning styles?

The results for 2009 showed that for September, 14 out of 27 who took part in the research emerged as having more than one learning style preference. That number represents 51.8% while thirteen children, or 48.2% claimed to have one learning style. In the 2010 results for September, 11 out of 28 children reported more than one learning preference, which represents 39.2% and 17 or 60.8% reported just one learning style preference.  Overall, 45.5% of the children from the two years combined reported having more than one learning style while, in the two years combined, 54.5% reported having one preferred learning style. No pressure was put on the children to answer in any way, we discussed at length that there were no right answers and none that would be better than any other:

> Work on preferred learning styles is misconceived if it simply tries to teach students dominances within their learning profiles; such an approach misses opportunities and narrows learning. (Younger and Warrington, 2005: 3)

Several authorities in the area have pointed out that a student with a repertoire of learning styles is preferable to a student labelled as having one learning style. In fact, labelling a student in this way might be detrimental to their learning:

> In fact, students have several learning styles, students must have a repertoire of learning strategies, and know how and when to use them. (de la Harpe and Radloff, 1998: 82)

> The last thing needed is to reinforce a belief in that individual that there is only one way an individual can learn. (Evans and Thompson, 1998: 99)

The results from the two years of study were not what I expected when I began this work. The results of 2009 showed that those who showed a slight kinaesthetic learning preference performed best according to teacher assessment. Teacher assessment was quite accurate, with over 85% the same as the results of the writing SATs test. Those who expressed a slight kinaesthetic learning preference improved by an average of 2.8 parts of a level, significantly higher than the national average of 2.0 parts of a level improvement in one academic year. The 2010 results showed that those appearing to have an auditory learning preference improved the most. Those with an auditory learning style averaged 3.2 parts of a level improvement, which was statistically significantly higher than the national average of 2.0 parts of a level. Children who reported themselves as visual/auditory learners, also improved more than the national average. They improved 3.0 parts of a level, which is statistically higher than the national average. One aspect of the 2010 results was unexpected, those with a slight kinaesthetic learning style performed below the level of the national average. In 2009, this group had performed particularly well and significantly above the national average of 2.0 parts of a level. The 2010 results returned an average improvement of only 1.0 parts of a level, well below that of the national average.

### 6.3.2 RQ4: What is the children's perspective on the kinaesthetic teaching and learning methods?

There are three main types of evidence which I can draw upon to answer this research question. The anecdotal evidence collected while the research was ongoing, the questionnaires, the results of which are shown in Table 5.16 and the interviews. There was, of course, a fourth type of evidence that I could draw upon, but which cannot be shared or used to demonstrate any findings, put simply, I was there. The level of excitement was palpable whenever we began a kinaesthetic activity. The children often had to be reminded to contain their excitement. I could see the joy with which they went about their work. It was clear that every child engaged in the activities enjoyed them.

### 6.3.3 RQ5: What is the role of the metacognitive process in children's learning?

I designed the questionnaire that was used to answer this research question. It is perhaps best described as a questionnaire about pupil attitudes towards learning. The questions were intended to find the pupils' metacognitive levels, but some questions were included to determine their mind set, whether they had a growth or fixed mind set. I designed the questionnaire so that in each case, the first response was indicative of a child who was less independent as a learner and less metacognitive. It addresses the mental process strand, and from the results shown in Table 5.17 a definite pattern can be discerned. The children who achieved level three opted for the second response to the questions more often than any of the other responses on 43% of their answers. The children who were level four chose the first option far less. Only 7% of their choices were for the first response, instead, they chose answers two and three at almost the same rate of 33% and 34% respectively. Of the children who were level five, only 2% chose the first answer. Answer number two was 21% of their selections; answer three, 32%; and answer four, 45%.

## CRITICAL DISCUSSION OF THE FINDINGS

### 6.4 RQ1: Are learning styles consistently chosen by individuals?

Although I partly addressed this question in chapter three, I need to explore other aspects of the findings here. Opinion is split about whether learning styles can be changed or whether, once acquired they are fixed. Some authorities would argue that they are not acquired nor learned, but they are inborn, in other words genetic. In terms of the question of the fixed nature of learning styles, Hastings, (2014: 1)[16] stated that:

> A minority of experts believe that preferred learning styles are genetically governed, and therefore hard to change. So the most important thing is to make life easy for children. Others argue that a preferred learning style is simply an acquired habit and that children need shaking out of their comfort zone. (Hastings, 2014: 1)

Amongst those who argued that learning might in some way be fixed, is Ginnis, who argued that while learners use a combination of senses in different situations, they have a dominant or preferred sense. 'The opportunity to use this preference for learning has a significant effect on their level of achievement and feelings of competence' (Ginnis, 2004: 39). Of the many voices ranged against such beliefs, were Stahl (1999) and Franklin (2006). Franklin criticised the relationship of boys to kinaesthetic learning in particular. The problem for Franklin was that the relationship has been used to validate students who are low achieving academically by describing them as kinaesthetic learners (Franklin, 2006: 84).

It should be noted that the theory of VAK was associated with Alistair Smith (1996). The exact origins of the term cannot be found, but Alistair Smith's name is associated with the theory. 'Our survey helped us track down VAK to the work of at least one author, Alistair Smith (Smith, 1996, Smith 1998, Smith and Call, 1991 and 2001)' (Sharp, Byrne and Bowker, 2008: 89-90). Smith never claimed that learning styles were fixed, and if this were found to be the case, he did not claim that they had a genetic determinacy. Dunn (1990) however, demonstrated that a visual learner might have difficulty learning where the teaching mode is through lectures. Lectures employ an auditory form of learning. As a result, auditory learners may prefer them and learn well

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[16] Hastings's article is the most recent update of an article first written in 2004.

from them. Another reason it matters whether the learning style of an individual is fixed is that some secondary schools in Essex and elsewhere still test their children and tell them what their learning style is in 2014. The implication that is often associated with this is that the learning style does not change; the child is then 'labelled,' a practice that might be detrimental to their education:

> The danger with differentiating pupils according to their learning preferences is that children will be labelled. (Possibly quite literally; there are reports of some schools making pupils wear badges proclaiming "I'm a kinaesthetic learner"). When this happens, children can easily be forced into a narrow view of their abilities, and may be discouraged from trying activities that don't fit their own preference. (Hastings, 2014: 2)

Other researchers found that learning style and teaching style mattered. O'Brien (1991) found that differences in learning styles were associated with academic achievement, the subjects represented a variety of subject majors in a university. Dunn *et al.* (1995) claimed that students whose learning style matched the teaching style performed better than those students whose learning style did not match the teaching style. Griggs and Dunn (1996) also found that those whose learning style matched the teaching style, performed better than those who did not benefit from such compatibility. When learning style matched teaching style, learners had a far more positive attitude towards learning as well.

The findings of this research contradict those who believe that learning preference is fixed, and strongly challenge the argument for a genetically fixed learning preference. The present work found that 33% of the children totally changed their learning preference, if learning styles are truly fixed, then these children have I presume, in some way changed their genetics. The findings of this study show that the children involved did not adhere to the same learning style, there was some variability in their choices. While some children were remarkably consistent in terms of the choices they made (approximately 33%), others changed their choices when asked to repeat the questionnaire later in the year. Other children changed their learning preference when the order of the questions was altered to test the Hawthorne effect. The results suggest that children of eleven do not claim the same learning style consistently over a period of one year. In this study, it was found that only a third report the same learning style over the course of a year. The findings support those reported by Raven *et al.* (1993) who

studied the learning preferences of students who were considerably older than those in the present work. They found a difference between trainee's preferences as 'beginning teachers' and the preferences that appear to emerge when they have 'become teachers'(Raven *et al.*, 1993: 46). This might mean that children of eleven change their learning preference or preferences over a period and that when older, they might change again to another learning style. It might also mean that they have learned, developed new skills or discovered other means of learning that they had not acquired before. In common with the work of Raven *et al.* (1993), this work does not support the genetic argument for learning style preference. If learning styles were genetically determined, learning style would be unlikely to change, the children in this study would have been expected to have been more consistent in their claimed learning style.

Another research study suggested that learning preference becomes more fixed as people age. In a study of 521 engineers, Felder and Spurlin (2005), found that 64% had a moderate to strong learning preference for visual approaches to learning. In this study, only four of the children were reported as having a strong and consistent learning style preference (9JF, 17NEa, 18Ea and 27Mi). The number who reported a strong preference represents a mere 7% of the children. It might be that as we mature, our learning preferences develop and become more fixed than they once were, the children in this study were too young to compare.

As stated above, in answer to research question one, not all children report the same learning style, claimed learning style changes over the course of a year. This finding would need to be substantiated however in a larger study to give more credibility to the findings.

### 6.4.1 RQ2: Can kinaesthetic teaching improve children's attainment?

When groups three and four of the 2009 intake are looked at, it can be seen that they have not exceeded the national average, in fact, they have performed less well than the national average. Group three improved by 1.60 parts of a level, with a standard deviation of 0.55. Group four improved by an average of 1.80 parts of a level with a

standard deviation of 0.45. Both groups three and four were found to be statistically significantly below the level of improvement of the national average.

The reason that groups three and four did not achieve the average of children for their age group could be any one of a number of factors, or, in fact, the reasons could be multiple. It might be the result of chance, the result of small numbers or the small sample size. Though it can only be speculation, it might be that a range of other factors came into play with those groups. There were extenuating circumstances for three members of group three; they had experienced personal issues outside of school. Whether this was the cause of their performance or not, I cannot tell. Another possibility is that both groups did not enjoy the work. This, however, is not borne out by the evidence, whether anecdotal or from the surveys. They might, of course, have been deceiving me, but having observed them and filmed them during the activities, I doubt that they were not interested. Some of the more enthusiastic comments during the activities were from amongst these groups (three and four). A third possibility is that they found the work difficult not conducive to learning, or that it was presented in a way that they could not access. There are a number of things that could be done to try to understand what happened with groups three and four; these will be further discussed in chapter eight, conclusions and recommendations.

The poor performance of groups three and four might have been the result of learning styles, perhaps they had a learning style that meant that they found it difficult to learn kinaesthetically. This was one factor that I needed to analyse. If it became apparent that, for example, groups three and four were all visual learners, then alarm bells would sound. I would have to desist from kinaesthetic teaching forthwith. The learning style of the children in the two groups is shown below in Table 6.1.

**Table 6.1 Learning style of pupils not making expected progress**

| Pupil | Group | Sublevels of improvement | Learning style |
|-------|-------|--------------------------|----------------|
| 12 | 3 | 2 | N/P |
| 17 | 3 | 2 | Slight K |
| 18 | 3 | 1 | Slight K |
| 28 | 3 | 1 | V/R |
| 29 | 3 | 2 | Slight K |
| 5 | 4 | 2 | Slight K |
| 11 | 4 | 2 | V/R |
| 20 | 4 | 1 | N/P |
| 25 | 4 | 2 | Kinaesthetic |
| 27 | 4 | 2 | N/P |

Table 6.1 shows that the children in groups three and four did not all belong to one learning preference group. The Table shows that 40% had a slight kinaesthetic preference. A further 30% had no preference; 20% had a visual/ reading preference and 10%, or one child had a kinaesthetic preference as a learning style. The biggest group of those not performing as well as the national average was those with a slight kinaesthetic learning preference. This finding was the opposite from what the results showed for 2009. The results of 2009 showed that those with a slight kinaesthetic preference was the best performing group, with an average improvement of 2.8 parts of a level. The learning style preference of groups three and four, would not appear to be the reasons for their performing below the level expected when compared to the national average. Whether the results were down to random chance or not could only be explored and supported or refuted by a bigger study. The results might be due to random chance. Seven of the ten children in groups three and four did achieve the national average of two parts of a level improvement, leaving three children who did not, two of whom had issues outside of school.

This question relates to the third strand of the work, the kinaesthetic strand. The results show that both classes engaged in this research improved more than the national average of two parts of a level. It had also been shown that when divided into ability groups, eight groups improved more than the two parts of a level, but two groups did not. When the children were divided into groups of their learning preferences, all five groups in 2009 outperformed the national average and five out of six improved more than the two parts of a level in 2010. The improvement cannot however be claimed to be the result of learning styles. The learning styles were claimed by the children and the claimed learning style changed over the course of the year. From the results of this research, I cannot answer the second research question, Can kinaesthetic teaching improve children's attainment? The findings of RQ1 that children's claimed learning style changes makes RQ2 null and void. The children in this study improved more than the national average but they might have done the same using another teaching method.

### 6.4.2 RQ3: Can the benefits of kinaesthetic teaching be attributed differently according to children's learning styles?

When I started, I had expected that the kinaesthetic learners would have improved the most from a year of kinaesthetic teaching. This form of learning would have been very accessible to them, they would have accessed the learning style very readily. I had assumed that those with other learning styles would have found this form of teaching less accessible. As a result, those with an auditory, visual and reading learning style would not have benefitted as much as the kinaesthetic learners. With these assumptions in mind, the findings are somewhat unexpected.

The results for 2009 showed that 14 out of 27 who took part in the research emerged as having more than one learning style preference. That number represents 51.8% while thirteen children, or 48.2% claimed to have one learning style. In the 2010 results, 11 out of 28 children reported more than one learning preference, which represents 39.2% and 17 or 60.8% reported just one learning style preference. Overall, 45.5% of the children from the two years combined reported having more than one learning style while, in the two years combined, 54.5% reported having one preferred learning style.

No pressure was put on the children to answer in any way, we discussed at length that there were no right answers and none that would be better than any other:

> Work on preferred learning styles is misconceived if it simply tries to teach students dominances within their learning profiles; such an approach misses opportunities and narrows learning. (Younger and Warrington, 2005: 3)

Several authorities in the area have pointed out that a student with a repertoire of learning styles is preferable to a student labelled as having one learning style. In fact, labelling a student in this way might be detrimental to their learning:

> In fact, students have several learning styles, students must have a repertoire of learning strategies, and know how and when to use them. (de la Harpe and Radloff, 1998: 82)

> The last thing needed is to reinforce a belief in that individual that there is only one way an individual can learn. (Evans and Thompson, 1998: 99)

The results of 2009 showed that those who showed a slight kinaesthetic learning preference performed best according to teacher assessment. Teacher assessment was quite accurate, with over 85% the same as the results of the writing SATs test. Those who expressed a slight kinaesthetic learning preference improved by an average of 2.8 parts of a level, significantly higher than the control of the national average of 2.0 parts of a level improvement in one academic year. The 2010 results showed that those appearing to have an auditory learning preference improved the most. Those with an auditory learning style averaged 3.2 parts of a level improvement, which was statistically significantly higher than the national average of 2.0 parts of a level. Apparent visual/auditory learners, also improved more than the national average. They improved 3.0 parts of a level, which is statistically higher than the national average. One aspect of the 2010 results was unexpected, those with a slight kinaesthetic learning style performed below the level of the national average (the national average). In 2009, this group had performed particularly well and significantly above the national average of 2.0 parts of a level. The 2010 results returned an average improvement of only 1.0 parts of a level, well below that of the national average.

In relation to the question, which children gained the most from kinaesthetic teaching? One child did stand out, he was 22Sm in group five. This child had a statement and as a result, an Individual Education Plan (IEP) for dyslexia, he loathed writing, he saw it as a chore and something that he could not do. At best, he would write three lines in half an hour, little of which was legible. He began the year as level 1A; he did not include full stops or any form of punctuation, nor did he necessarily sequence his work. This child gained more than anyone; he was entered for the SATs and achieved a level three. That level of improvement means that he improved by four parts of a level, or twice that of the national average of two parts of a level.

22Sm started to enjoy story writing and school in general when we began our kinaesthetic work, he enthusiastically worked on the Warhammer game board, along with a group of three other boys. He wrote a story of around a page and a half, and clearly enjoyed the experience of writing. It was when we were doing the spy work that 22Sm appeared to change. The dyslexia was still there, but he was so enthused by the activities that he ignored it and just wrote. The change in him was apparent to everyone. He gained confidence and became a lot happier, smiling more often than he had before. Even more unexpected, his mother came into class to ask what had happened to her son. I was not sure what she meant. She informed me that when he got home, he would rush upstairs to continue his story about spies. She could not believe the transformation in him, she had also noticed the change in his temperament and level of happiness. This is only one child, who did not reach the expected minimum standard of level four for a child of eleven. If I had to choose one child who had gained the most, it would be 22Sm; he had improved more in two terms than he had in five years of schooling. 22Sm had achieved more than I could have hoped, four parts of a level in less than one year. I would not claim that this would be repeatable in every case. I would not claim that the same result would occur for more than a small number of children. I would claim however that by using Mantle of the Expert and kinaesthetic work, some children will be enthused, and it might be the last ones that one might expect.

When trying to answer which children gained most from kinaesthetic teaching, it did not occur to me to divide the children into boys and girls. I had not asked the question, are there gender differences that are associated with learning style preferences? Bricheno

and Younger (2004), suggested that boys preferred a kinaesthetic learning style. It might have been that boys gained more from kinaesthetic activities than girls; more research would need to be done to determine that.

The findings are not those which I had expected when I began this research; those who benefitted most from kinaesthetic teaching were not those who had claimed to be kinaesthetic learners. It would appear that the group that would benefit the most from kinaesthetic teaching methods is the result of random chance. Who improves the most might be down to the individual interest of the children, their level of motivation or the preference of the children. The level of improvement cannot be determined in terms of learning style. It must also be remembered that the learning styles claimed by the children are not claimed consistently. I will now address the fourth research question.

### 6.4.3 RQ4: What is the children's perspective on the kinaesthetic teaching and learning methods?

This research question also related to the kinaesthetic strand, I will begin the discussion with some anecdotal evidence. Towards the end of the year, I chatted with the children and asked them what they had enjoyed and what I could do better or how we could change some of the activities they had experienced. The same response came from all children each year that I taught year six; a few of the responses are given below (Peter Gordon Lawrence (PGL) is a residential centre that year six children visit for a week):

> The best thing was PGL[17], then after that, the spy stuff was the best, that was the best work I have ever done! I also loved art and the maths restaurant work... and then the murder mystery. (8Lt, 2009)

> I loved the spy work, that was nearly as good as PGL, those were the best two things we did in primary school, after that, it was the murder mystery and maths that I liked best. (19El, 2010)

The irony did not escape me, in answering the question, almost all of the children said that the most exciting activities they had experienced were not in school at all! Of course, ideally, we would teach at a residential centre the whole year, but that would be

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[17] PGL is an acronym for Peter Gordon Lawrence, the founder of a residential centre that is visited by the year six children. It is an adventure centre that builds confidence through a range of activities.

impossible. The results of the questionnaires provide the reasons why the children enjoyed the kinaesthetic activities and the spy work, in particular.

Their choice of adjectives demonstrated their enjoyment of work, excited, scary, thrilling and amazing and other such adjectives. The answers to the second question were particularly rich in emotions felt for the experience. The responses that they reported were often like those below:

> Being a spy is a warm feeling inside. But if I were sent to war I would be worried if I were seen. (1Ch, 2010)

> It was an amazing experience because I had to sneak out of the class without being caught. (12J, 2010)

There was no doubt that the children enjoyed the work. The work was carried out in a school however, and there had to be a learning objective to everything that we did. Did the children feel that they learned and did they think that role-playing in the Mantle of the Expert role helped them with their subsequent writing tasks? The interviewees reported similar benefits of the work, in answer to question five, did anything this year help your writing to improve? All of those interviewed mentioned that having done the work helped them to remember what to write next. This was repeated on the questionnaires, the responses to the question how did it help you to write? Several children said that it helped them with their vocabulary, such as:

> because it made me think about what exciting events and it improved vocabulary (I think). (28Aa, 2010)

A second child mentioned the sensations, 'It helped me because I didn't know the sensations about being a spy. It helped my action as I knew how I felt when someone almost spotted me'. Another commented that he or she could 'remember the tension in the missions'.

From their comments, the children felt that the work helped them in a number of ways. Some felt that, it helped them to develop their vocabulary, perhaps through the conversations that went on when the work was progressing. Others felt that by having

acted out the roles in the kinaesthetic work, they could include emotions that might otherwise have been lacking in their writing. To answer the research question four and address the second strand (mental processes), the children enjoyed the work and felt that they developed in their understanding of the writing task. They also felt that their work was enriched by the experience because they were able to include sensations and emotions having lived through the excitement. I will now discuss the findings of the fifth research question that relates to the cognitive strand.

### 6.4.4 RQ5: What is the role of the metacognitive process in children's learning?

I designed the questionnaire that was used to answer this research question. It is perhaps best described as a questionnaire about pupil attitudes towards learning. The questions were intended to find the pupils' metacognitive levels, but some questions were included to determine their mind set, whether they had a growth or fixed mind set. I designed the questionnaire so that in each case, the first response was indicative of a child who was less independent as a learner and less metacognitive. It addresses the mental process strand, and from the results shown in Table 5.17 a definite pattern can be discerned. The children who achieved level three opted for the second response to the questions more often than any of the other responses on 43% of their answers. The children who were level four chose the first option far less. Only 7% of their choices were for the first response. Instead, they chose answers two and three at almost the same rate of 33% and 34% respectively. The children who were level five chose the first answer only 2% answer number two was 21% of their selections, answer three, 32% and answer four, 45%. The results show that the most metacognitive with a growth mind set children achieved higher levels than those who were less metacognitive and who had a more fixed mind set. This was too small a study to draw definite conclusions. Clearly more research on a far larger scale would need to be carried out in order to obtain more evidence about metacognition, mind set and achievement.

### 6.5 Triangulation of kinaesthetic memory

A concept was beginning to emerge from the anecdotal evidence, the concept of kinaesthetic memory, I needed to triangulate the comments from other sources to check the reliability of these findings. Triangulation relates to the use of more than one approach to an investigation into a research question in order to support findings and

increase confidence in the findings. By explaining that the origins of triangulation lay in navigation Cohen and colleagues go on to explain:

> By analogy, triangular techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint'. (Cohen, Manion and Morrison, 2007: 141)

**Triangulation of results**

anecdotal evidence

interview evidence ——————— questionnaires
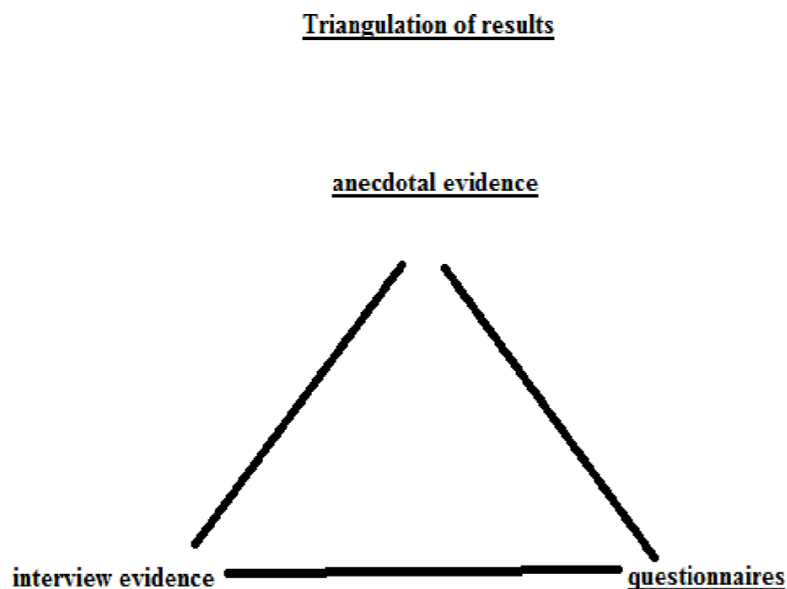
**Figure 6.1 the three elements of triangulation**

Triangulation as a concept was intially used in social and behavioural research. One of the earliest references to triangulation was in relation to the idea of unobtrusive method:

> Once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly diminished. (Webb *et al.*, 1966)

The interview with WM1, described in full in Chapter five reinforced the idea of the kinaesthetic memory. Question five in particular in which WM1 discussed how his writing had improved, the question was, did anything this year help your writing to improve?

- WM1: Yes, doing things myself.
- Me: Can you explain that, can you explain what you mean?

- I found it easier to write after I'd acted it because I could remember what I'd done so I knew what to write next.

- Me: So it helped you with the writer's block?

- I don't know what that means?

- That's where you find it difficult to write, and you can't think of what to write next. Did you find it easier to write after you'd acted out one of the roles?

- Yes. I remembered what I'd done, so I knew what came next.

The last comment builds on the anecdotal evidence in my field notes of what the children said when they were working, having 'done the work' they could remember what came next. I am aware that the questions were closed, but as stated in chapter five, I had deliberately made them closed in an attempt to find out exactly what the children thought as discussed in chapter five. I did feel guilty at first when I looked at the transcript of the tape, I felt that it might be seen as my steering of the interview the way I wanted it to go. There were of course aspects of the interview not portrayed in the transcript, a sense of unease of the child being interviewed, where I elaborate, is often an attempt to overcome such 'tense' moments. There is also a lot of communication missed, nonverbal, signs and signals made between the people involved and body language. Effective interviewers communicate in a number of ways, they:

> Communicate personal interest and attention to subjects by being attentive, nodding their heads, and using facial expressions to communicate. (Bogdan and Biklen, 2007: 104-5)

People who are effective interviewers might ask for clarification and ask a person to elaborate. 'Not all people are equally articulate or perceptive, but it is important not to give on an interviewee too quickly' (Bogdan and Biklen, 2007: 104-5). Having read those words, I felt as though I had not so much steered the interviews in the direction that I wanted them to go, but more acted as a good interviewer. I hoped that I'd helped the children through the experience by elaborating my meaning. I am of course always mindful of the influence of the researcher upon their work, as such I might be accused of bias.

As I searched my field notes, I found more and more recordings of phrases like 'I knew what to write next', 'I didn't get stuck like I usually do', it was apparent that the work had helped them to overcome the writer's block. The field notes supported the other forms of evidence, something was helping the children to remember the activities that they had carried out.

## 6.6 Triangulation of emotional contagion

In order to reduce the impact of my influence upon the results, the results were then triangulated using the responses to the questionnaires, completed by eighteen of the children about the spy work. In answer to question four (Do you remember why we did the spy work)? Five children or 22.7% mentioned that they had either learned about being spies or that they'd experienced it. Experience relates to memory; experience helps children to remember. In answer to question five (Did it help you to write)? Nine children, or 50% of the respondents mentioned that they could include their emotions and or experience. The responses to question six also suggest memory of the events. Six children or 33% said that they found it more exciting having been through the events. Five children, or 27% added that they could include their feelings and the tension, both of which imply memory of the activity. Question seven included some interesting responses, seven or 35% said that experiencing being a spy improved my (their) writing. One other child (5%) said that it added realism and two more (10%) mentioned that they learned more easily by doing it.

## 6.7 Summary of the findings

Two concepts began to develop from the results, the first concept was that the work generated memories that helped the children to write more easily. The second concept was that the work was exciting, and that it generated a number of emotions in the children at the same time. Kinaesthetic memory, or muscle memory describes the process where a memory is formed through the repetition of an action. The second concept, emotional contagion relates to the transference of emotions between individuals engaged in an activity. What is new in this work is the fusion of the two concepts. In the next chapter I will discuss the three strands, followed by the two

concepts in greater detail and then the fusion of the two concepts, kinaesthetic memory and emotional contagion.

# CHAPTER 7

## EMOTIONAL CONTAGION AND KINAESTHETIC MEMORY: A NEW FUSION OF CONCEPTS.

### 7.0 Introduction

In this chapter I will begin with a discussion of the relevance of the three strands to education. I will go on to discuss kinaesthetic memory and emotional contagion, and follow with a discussion of a novel fusion of the two concepts and discuss how this fusion of the two concepts might be used in teaching to instil enthusiasm and help children to learn. Kinaesthetic memory and its fusion with emotional contagion emerged from first-hand observation of the children and the things they said that I recorded in my field notes, interviews and surveys. The two concepts also resonate with experiences from my previous thirty years of teaching but up until this work, I had not articulated my ideas. There is always great excitement generated whenever the children make, do or get up out of their seats to role play or do drama. The novel fusion combines two of the strands of this thesis, the social strand and the kinaesthetic strand. I will discuss how the social aspect of 'doing' work together is important in the generation of the kinaesthetic memories.

### 7.1 Language in the social strand

Kinaesthetic activities are always accompanied by excitement, enthusiasm and desire. There were several important aspects of the social strand, one is language. Language is the most important medium through which learning occurs. Language is important for learning in the external environment, or social sphere as well as internally, within the psyche of the individual. It is through an internal dialogue that knowledge and ideas are reinforced, and committed to memory, or retrieved and used to reason. Language is the link between the inner consciousness of the individual and the social world:

> Although the reality of the word, as is true of any sign, resides between individuals, a word at the same time, is produced by the individual organism's own means without recourse to any equipment or any other kind of extracorporeal material. This has determined the role of (the) word as the

semiotic material of the inner life- of consciousness (inner speech).
(Voloshinov, 1973: 14)

Vygotsky (1986) argued that language played two critical roles in cognitive development. The first role is that language is the main method used by adults to pass on information to children. The second role of language is as a tool through which intellectual adaptation can occur. Children use internal speech to plan activities and strategise. In doing this, they promote their own development through internal language. Language therefore accelerates thinking and understanding, language develops from social interactions to enable us to communicate. Inner speech that develops from language then enables thought. It is believed however, that they do not have the same genetic link, they evolved at different times.

In this study, the importance of language and the ability of the children to talk when doing a task was highlighted by their conversations some of which, but by no means all, were recorded by me while the children were working. I overheard a conversation between two of the children that I thought worthy of recording. 'It helps me when I talk with my friends' (11Mn, 2009); 'yes, I understand it better when other children explain it as well' (18Zl, 2009). Although I did not want to bias results or intervene more than I had to, I felt that I had to probe to try to find out more of what they thought. I asked the question, 'how does talk with your friends help?' The answer that was given reinforced the idea of talk partners that was being trialled by several staff including me at the time. 'Sometimes somebody says something, then someone else says something, then sometimes, I get another idea that's even better' (29Hk, 2009). Although the discussion was about language and how talking improved their understanding and their ideas, I was also drawn to the social aspect of the conversations. This was not the only conversation of this type that I had heard over the years. The social aspect of the children's responses mirrored much of what I had read in the literature and reinforced the social nature of the learning activity.

## 7.2 Co-operation in the social strand

I asked the question, 'does it help to talk about work with your friends and if it does, how do you think it helps?' Some of the responses surprised me, 'sometimes I don't get the teacher, but I do get it when my friends explain it to me' (6Al, 2009). 1As gave a similar response, 'I understand better when my mates go over it, the teacher [me] goes too fast sometimes'. Two very mature responses came from the children in the 2010 group, 'when we chat we sort of bounce ideas off each other; then my ideas get better (13Fl, 2010). The second comment was 'it's like mind showers, we all say something then it all comes together' (14Ax, 2010). The children's words replicate the belief of the Reggio Emilia Approach. The schools of Reggio Emilia believe that: 'only as children articulate to others that which they believe to be true do they come face-to-face with errors in their thinking' (Stanley, 1988: 21).

It was clear that children working collaboratively were likely to achieve more than children who were in a classroom setting or learning environment in which they were not allowed or encouraged to cooperate and to share ideas. Dewey (1966) argued that the school and the educator must 'educate' not 'school', he also emphasised the importance of the social aspect of learning:

> I believe that the school is primarily a social institution. Education being a social process, the school is simply that form of community life in which all those agencies are concentrated that will be most efficient in bringing the child to share in the inherited resources of the race and to use his powers for social ends. (Dewey, 1966: 48)

Learning is a social phenomenon in which cognitive development is largely developed through social interaction. Vygotsky (1978) felt that development cannot occur until social learning has occurred. This is the opposite of the ideas of Piaget, who believed that development had to occur for learning to take place.

> Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). (Vygotsky, 1978)

Vygotsky (1978) believed that social interaction was fundamental to the development of cognition. He argued that the community was vital to the 'making of meaning' about the world. On the other hand, Piaget (1950) argued that for learning to occur, a child's development must have taken place. Vygotsky believed that: 'learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological function' (Vygotsky, 1978: 90). In other words, social learning tends to precede development.

A second aspect of the social nature of learning, is that of the role of the More Knowledgeable Other (MKO). The MKO represents a person (or technology that aids learning) that has a higher level of knowledge or a better understanding of a task or concept. The MKO might be a teacher or adult, or it could be a peer or a technological aid such as a computer. The MKO operates through a process called scaffolding, an idea first introduced by Vygotsky, developed by others, and named by Bruner. The MKO must also use scaffolding, when they help an individual who is less knowledgeable than themselves through carefully selected stages in the acquisition of the new knowledge. When scaffolding, the MKO must carefully manage frustration of the learner, model solutions, and reduce the degree of freedom within the task, amongst other skills. To be successful, the MKO must operate on an 'implicit theory of the learner's acts (Wood *et al.*, 1976: 99).

The MKO mediates between the child and the world. Mediation is the process where:

> 'the developing human organism and an experienced intentioned adult, who by interposing himself between the child and external sources of stimulation " 'mediated' the world to the child framing, selecting, focussing and feeding back environmental experiences in such a way as to produce in him, appropriate learning sets and habits".' (Feuerstein, cited in Lidz, 1991:67)

The role of the MKO is important, and stages in the teaching of a concept, must be considered. It is not enough to mediate alone, or even just to scaffold. Learning must also be purposeful and have the commitment of the learner, in other words; the learner must have internal motivation. The tasks must also be slightly too difficult, just out of reach, or beyond the means of the individual who is learning. Practice must be purposeful, it must develop some aspect of what is being learned, or must have an objective, what might be called a learning objective.

The role of the MKO was seen in this work, very often as the teacher, I felt more of a facilitator, someone who created the learning conditions. The children often learned from each other; this was the case where they had not understood a point or concept that I was trying to teach. An example of a child acting as an MKO is a conversation that I hastily recorded while they were working on the murder mystery:

21Jo: So the victim could have been Ali Corbett.

27Mi: No it couldn't!

21Jo: Why not?

27Mi: Because the victim was a woman and Ali is a man's name.

21Jo: Ok who could it have been then?

20BJ: Any of the women.

18Ed: How do we know what women?

27Mi: From the missing person's report.

21Jo: So it's any of the women on here but nowhere else?

27Mi: Yes it must be!

18Ed: Why?

27Mi: Cause that's all we've got to go on.

21Jo: What about all the other evidence?

18Ed: I don't get it!

27Mi: The only thing we can use to find the person is the missing person list and it has to be a woman.... from the picture we had.

18Ed Why, I don't get it.

27Mi: Cause that's all we have got to go on.

27Mi tried hard to keep the group on task and attempts to help the others in the group to understand. I had already outlined how they should use the resources given to them, but

without 27Mi, this group would not have kept on task and would not have achieved as much from the lesson. Children learned from each other, they taught each other, trusted and cooperated with each other, the incorporation of a social strand in teaching is important to education.

## 7.3 The cognitive strand

The individual needs three important states of mind, they must have motivation, belief (that they can learn), and a growth mind set. Motivation is vital to the development of meaning practice, which can only come from the decision to dedicate oneself to the enterprise. This is called internal motivation, 'where motivation is internalised; children tend to regard practice not as gruelling but as fun' (Syed, 2010: 59). To develop and learn, the individual must dedicate themselves to the task in hand, only then can they develop. Motivation is discussed in more detail in chapter two, literature on learning.

A growth mind set is important in two respects, it determines how the learner views their starting point, and how they view failure. A growth mind set is the belief that intelligence can be enhanced. It believes that it can be developed and enhanced; this is paraphrased by Dweck when she wrote of the responses of students to questions related to growth mind set.'You can always substantially change how intelligent you are' (Dweck, 2006: 17). The opposite viewpoint is that of a fixed mind set, 'you have a certain amount of intelligence, and you can't really do much to change it' (Dweck, 2006:17).

Each mind set affects how students behave in class; it also affects how they approach learning, and how prepared they are to take risks with their learning. Dweck quoted the words of a seventh grader:

> I think intelligence is something you have to work for... it isn't just given to you... Most kids, if they're not sure of an answer, will not raise their hand to answer the question. But what I usually do is raise my hand, because if I'm wrong, then my mistake will be corrected. Or I will raise my hand and say, 'How would this be solved? Or I don't get this. Can you help me? Just by doing that I'm increasing my intelligence. (Dweck, 2006:17)

In one investigation, a group of children had their mind sets evaluated just before they moved to junior high school in the US. They were asked whether they believed that their intelligence was a fixed trait or whether it could be developed; they were then followed for the next two years. What was found was that grades suffered over the period for some of the students, but not all students suffered to the same extent? 'In our study, only the students with the fixed mind sets showed the decline. They showed an immediate drop off in grades and slowly but surely did worse and worse over two years. The students with the growth mind set showed an increase in their grades over the two years' (Dweck, 2006: 57). When they had entered junior high, their past records were indistinguishable. When asked to give reasons for their performance, those with a fixed mind set invariably maligned their abilities, saying things like 'I am stupid', or blamed they the teacher. When facing difficulties with work, those with growth mind sets dug in and got on with the challenge. 'Individuals with the growth mind set have a belief about the nature of talent that is actually corroborated by the evidence' (Syed, 2010: 118).

A growth mind set is a radical change in thinking, to achieve a growth mind set; an individual must see things in a totally different way. It involves a change of a negative attitude in which people are judgemental to a positive one in which people are prepared to take risks without fear of being judged. 'When people- couples, coaches and athletes, managers and workers, parents and children, teachers and students- change to a growth mind set, they change from a judge and be judged framework to a learn and help framework'(Dweck, 2006:244). The change in attitude allows growth and development, but also takes plenty of time and effort, as well as a commitment.

A belief that something can be learned is an essential prerequisite for learning; belief can help people achieve, perhaps where they might otherwise fail. Edwards, the British triple jumper, used his devout belief in God to his advantage when competing. As he walked out onto the field to compete, he would pray, saying the words, 'I place my destiny in Your hands. Do with me as You will' (Syed, 2010:140); it was this belief that helped Edwards to win gold medals at numerous games. The nature of the belief is immaterial, Muhammed Ali, used his belief in God to win against his opponents. What Ali believed was different from Edwards, but what was important was not the nature of the belief, but the belief in itself. The fact was that they did believe in something, in this

case, a divine creator who was on their side, as Muhammed Ali said, 'How can I lose when I have Allah on my side?' (Syed, 2010:141).

 Belief can work the other way as well; it can become a barrier to success, especially where negative stereotypes are concerned. There are two widely held stereotypes; one is that African Americans are less intelligent than white people, and the second is that women are not as good at maths and science as men. There are circumstances where stereotypes become important, such as during an intelligence test. In an intelligence test, African Americans are at a disadvantage compared to comparable white students taking the same test, because of an extra psychological burden. In effect, the psychological burden comes from a fear that the test may confirm a racial inferiority. It is because of a stereotypical label that anxiety is generated in the test. As a result of the burden, there is an impediment to performing at their best that in turn results in lower scores and a poorer performance. An added problem comes from what Steele saw as a defensive move. To defend against such stereotyping threat, black students might not identify with academics, which in turn adds to the problem.

Those with a growth mind set can transcend the negative effects of stereotypes. On the other hand, those with fixed (negative) mind sets are restricted in their performance whether they have a positive label or negative one. If one is labelled as intelligent, the fear will be of losing the label through poor performance. If one is labelled as inferior due to race or gender, one is afraid of proving that the label is deserved. When teaching students, it is clear that effort should be praised, not intelligence; this at least in part will help to create a growth mind set in the minds of those under instruction. By helping to engender a growth mind set, students who are willing to take risks and try more difficult challenges are encouraged as opposed to pupils who are concerned about 'losing face'. If pupils are not prepared to take risks by doing more difficult challenges, (as in the case of the fixed mind set group), then they will not learn as quickly as growth mind set people. The learning of the fixed mind set individuals would constantly repeat the types of problems they have encountered to date. A growth mind set is essential to learning.

The task should be beyond the ability of the learner and that learners should practice what has been learned goes without saying. When the children have learned, they should then apply the new knowledge to different situations. To learn and progress, the

task should be slightly beyond the ability of the learner. Although the following example is from sport, it applies to learning, in general, Syed practiced by playing opponents. Though physically arduous; it did not place special demands on his mind and body. It was not until he was trained in Chinese methods by Chen Xinhua that he began to develop.  Instead of playing against other players, his new coach would fire a bucket of a hundred balls at him, always at different angles, speeds and with different spins. The training was 'constantly nudging the outer limits of my speed, movement, technique, anticipation, timing and agility' (Syed, 2011:75). Over a period of five years, movement, speed and positional awareness were dramatically improved, and the world ranking of Syed rocketed. China had been at the top of table tennis for years. The Chinese were not born with faster reactions, they did not have a better diet, they were not even training for longer, they were training smarter instead. Training to improve is all about purposeful practice, practice designed to achieve a small part of the overall skill:

> Purposeful practice is about striving for what is just out of reach and not quite making it; it is about grappling with tasks beyond current limitations and falling short again and again. Excellence is about stepping outside the comfort zone, training with a spirit of endeavour and accepting the inevitability of trials and tribulations. Progress is built, in effect, upon the foundations of necessary failure. (Syed, 2011:79)

It is the learner's response and attitude to this failure that is important. With a growth mind set, they can learn from their mistakes, in fact, more can be learned from failure than from success. It is especially the case where a learner is metacognitive and can identify where they went wrong, or where they can break down the process into its parts.

I saw the impact of external factors on the learning of children every day. Often, a child did not understanding or was clearly not learning or focussing. Either the Learning Support Assistant (LSA) or I would ask them what the matter was. The cause might be something that happened at home, or that their pet was ill, or it might be that someone in class had upset them. The impact of such concerns would be dramatic, affecting their learning and concentration. Cognition is influenced by a wide variety of factors both in and out of school, the cognitive strand was central to this study and to all teaching, motivation and metacognition are two of the most important aspects of learning.

## 7.4 The kinaesthetic strand

Laszlo Polgar was one of the earliest proponents of the practice theory of expertise. He 'used' his daughters to help prove his theory, he wanted to show that they could be trained to become experts in some field. 'The tale of the Polgar sisters provides scintillating evidence for the practice theory of excellence' (Syed, 2011: 65). Everyone present at the time when Susan won a local chess competition was convinced that she was a unique talent. What the onlookers missed, was that they saw the end product of a lot of work. 'They had witnessed only a tiny percentage of the activity that had gone into its making' (Syed, 2011: 65). They had not seen the painfully slow process and inch by inch improvements that had gone into making her a chess champion. Learners can be inhibited, harmed and restricted by labels and a fixed mind set, the plasticity of the ability to learn must be remembered by educators.

Polgar took time to decide which area he would train his daughters to excel at. He determined that chess had an objective rating system based on performance so that people could not dispute whether they were the world class or not (Syed, 2010: 61-62). Had he trained them to excel at art or writing, people could dispute whether or not they were truly world class. At the start, Polgar was merely a hobby player of chess, and so he read extensively about chess pedagogy, and was training his first daughter, Susan, several hours a day; training for the game even before she was four years old. Polgar eventually had three daughters; each was trained to play chess. Each of them became grandmasters, with Sofia rated 'the fifth greatest, by man or woman, in history' (Syed, 2010: 64). Polgar spent thousands of hours training his daughters, acting as their MKO, but also, Polgar would appear to have added weight to his argument that practice can in itself achieve expertise.

According to Syed (2010), Shizuka Arakawa, an Olympic figure skater, fell on the ice repeatedly. The question could be asked, why would someone endure so much failure, pain and potential injury? Perhaps many would stop an activity at which they failed so often, falling as she had more than 20,000 times. 'Dweck's research hands us the answer: it is because she did not interpret falling down as a failure. Armed with a growth mind set, she interpreted falling down not merely as a means of improving, but

as evidence that she was improving' (Syed, 2010: 119). It was through failure that she had an opportunity to develop, learn and adapt. This attitude to failure, difficulty and challenging work was exhibited by people ranging from young children to young adults in a study by Dweck. When asked when they felt smart, people with fixed mind sets mentioned not making mistakes, finishing fast and producing perfect work, or when it was easy for them and difficult for others. Those with a growth mind set however mentioned things like, not being able to do it at first, but being able to later. Others with a growth mind set mentioned the effort they had to put in, for them it's not about immediate perfection. It's about learning something over time, confronting a challenge and making progress. This discussion of the kinaesthetic strand began to draw upon the other strand. In reality, the strands cannot be isolated, for learning to take place, the three strands should be the bedrock of teaching practice. One aspect of this study that is important is that there is a need for fun and play in learning and the need for children 'to do'. I now turn from a general discussion of the kinaesthetic strand to kinaesthetic memory.

### 7.5 Kinaesthetic memory

Honigsfeld and Scheiring (2004: 488) claimed that Confucius made the first reference to learning styles. Confucius had said 'I hear, and I forget, I see, and I remember, I do, and I understand.' Despite this, it was not until the mid-20th Century that it was recognised that individuals learn new and difficult skills in a number of different ways.

The idea of kinaesthetic memory came from the responses made by the children, the concept leapt out at me from the anecdotal evidence, the children repeated the idea again and again. When I spoke to them, they mentioned that they found the writing easier (than they had in the past) because they had 'done it.'

Kinaesthetic memory is sometimes referred to as muscle memory. Muscle memory is mentioned by Syed (2010: 34), when analysing the nature of 'talent'. He looked at the skills set of Federer, the famous tennis player. He argued that Federer would not be able to tell you why he had such an immaculately timed forehand. Syed argued that this was the result of movement that had been practiced for so long that the movement had become encoded in the implicit memory. The process of this encoding results in 'what

psychologists call expert-induced amnesia' (Syed, 2010: 34). He argued that great shot making was not about the development of 'muscle memory' but about a memory that was encoded in the brain and the central nervous system.

Another expert agrees with Syed that muscle memory is not about a memory stored in the muscles, but 'in our wires'. When a backhand is struck, an impulse is sent 'down those fibres, like voltage through a cord, triggering other fibres to fire' (Coyle, 2010: 37). Although the term muscle memory has developed and is used, the memory is not in the muscle, but it is in the brain and the central nervous system.

> When a coach uses the phrase "muscle memory," he is actually talking about circuits; by themselves, our muscles are as useful as a puppet without strings. As Dr. Fields puts it, our skills are all in our wires (Coyle, 2010: 37).

A definition of muscle memory is, 'Muscle memory can be described as gradual adaptation of muscles over a period of time to perform a new movement or action' (Hassanpoor et al, 2012: 770). How muscle memories are formed is unknown, but a theory of their formation has been proposed:

> Its precise mechanism is unknown; however, it is now known that when a motor skill is learned it leads to significant brain activity. Astrocytes are the most abundant glial cell types in the CNS[18] that play an associative active role with neurons in learning and memory (Hassanpoor, 2012: 770).

It is argued by Hassanpoor et al (2012) that Astrocyte cells are interconnected to neurons by gaps that form an astroglial network that allows fast communication and synchronicity. What is known is that muscle memory is the result of repeated actions, the same walk, throw or kick again and again. Hassanpoor et al postulate that muscle memory occurs in the frontal lobes, or the cerebellum.

> Although the precise mechanism of muscle memory is unknown, it is theorized that when an individual learns a new motor activity or practices an older one, it leads to significant brain activity at that time in the anterior cingulated gyrus, prefrontal cortex, primary motor cortex and cerebellum, areas related to higher

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[18] CNS refers to the central nervous system.

learning, planning, coordination and execution of motor function (Hassanpoor, 2012: 770)[19].

The role of muscle memory is clear, without it life would be difficult if not impossible. It allows people to act without thinking, a baby learning to walk is an example of the acquisition of muscle memory. Having to think about each step would result in an evolutionary backwater, the organism would soon be caught and eaten by a predator. Muscle memory would appear to be an inbuilt system that allows organisms to learn essential bodily functions without the need to think about them.

> The basis of our hypothesis is the fact that during training or motor learning period, neuronal output data related to learning lead to certain specific pattern for stimulating target muscles over a period of time and partly these data are stored in astroglial network. This stored data fine tune glial parameters that affect synaptic space and neuronal output used to perform rapid motor actions. (Hassanpoor, 2012: 770)

This statement that the muscles were targeted over a period of time is the difference between muscle memory and kinaesthetic mind memories as described by the children in this study. Each of the activities was undertaken just once, it was not repeated, yet the excitement of the activity caused the formation of a strong memory of the events undertaken.

In the context of this study, a kinaesthetic memory is the result of an action that causes the creation of a memory in the mind of the child. The event had to be significant and exciting to form the memory and in terms of this study, it had a physical component, a board game, or an exciting activity.

### 7.6 Evidence for kinaesthetic memory in this work

Kinaesthetic memory relates to Bruner's theory of 'learning as discovery' in which 'children's independent exploration helps them to understand and remember crucial concepts' (Bennett and Henderson, 2013: 169). The concept of kinaesthetic memory is

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[19] A diagram of the parts of the brain can be found in Appendix 3.

best demonstrated by reference to the part of a conversation between the members of one 2010 group that followed the practical Warhammer game session. The children were at the planning stage, prior to the writing stage:

20BJ What happened next?

8BeH We got to the woods, and we got attacked by the Orcs.

20BJ ...and … (named- 25Ca) got killed.

8BeH Yes but the wizard brought him back to life with his special powers.

25Ca  Then I got up and killed some of the Orcs and eventually I returned to full health.

9JF  I was cut on the arm, and I nearly got killed, but not quite.

20BJ  There was a big battle with the leader of the Orcs, the thief, and the warrior were fighting him.

24Em We didn't have to kill them all, they ran away once we killed half of them, or we killed the leader.

20BJ  The battle took us ages.

9JF … After the battle, we'd be really tired.

20BJ The Orcs wouldn't come back they'd be too tired.

9JF Yeah they'd all be exhausted!

24Em  After that we'd run out of the woods.

20BJ  No we didn't, we'd be too tired, we'd light a fire and recover.

8BeH  It took us another three turns to get out of the woods, so we didn't just run out!

20BJ  So we'd make camp and try to recover from our wounds. The Orcs would be too scared to come back.

8BeH  Yes... and we killed their leader that's when they all ran out of the woods.

24Em  We'd be hungry as well so we'd want to eat.

The conversation continued for some time until they were happy that they had remembered all of the events in the game. Some events were made up or discussed together, but it was clear that the children recalled the main events from the Warhammer game that they had designed, made and played with.

The board game became the story line, and different stages of the game became the main events that they were able to recall from having played the game. To help with their memory of events and the planning of the story the children sat and worked

together in their groups. The board game and characters were on their tables in front of them as they worked. I encouraged them to use the characters and the board to develop the story line. Although some events were made up, the main events were clearly recalled from the activity of playing the game. I did encourage them to make up events that hadn't happened, because it  helped to develop their speaking and listening skills, social skills, and their imaginations. Physically moving characters around a board game helped them remember or developed their kinaesthetic memories.

The phenomenon of kinaesthetic memory was also exhibited in the other activities. Having viewed the range of evidence such as the newspaper headlines, CCTV reports, the wedding guest list, the children had the features of the information ingrained in their minds. The murder mystery (which they were told was made up) began with the outline of the murder victim in tape on the floor. It took on a MoE perspective when the children were asked to take on the role of detectives and to examine all the evidence in order to identify suspects. The children were asked what the next step would be and following a short group discussion, they decided to search the school premises and grounds. The children investigated other classrooms at break time with the permission of other teachers. We also searched the grounds, which comprise a large area of playground, area of grass, garden and woodland. They decided that we should form a line to search for evidence with everyone scouring the ground as we walked. Several pieces of evidence were collected including blood stains (red paint), a plastic knife with blood on it and a piece of torn jeans on the barbed wire which formed the boundary in the woods.

In the subsequent planning and writing stages, the children made constant reference to what they had done, the order of events and the evidence. From the discussions held, it was clear that the children remembered things more clearly because they had carried them out and because the activity had been practical. It was something they had lived through. The following extract of a conversation is taken from the 2009 class:

 27J  The trail of blood, led to the fence and then there was the piece of torn jeans on the fence.

20Sj  So the murderer ran through the woods and got caught on the fence.

18Zl So now we know how they escaped.

20Sj  it could have been a trick, and maybe they didn't go out that way.

27J  No I think he did because we didn't find anything else so they must have got out that way.

20Sj  And we know the murder weapon, the knife, cause we found it.

27J That might have come from the dinner ladies.

The activity helped to create a memory that the children could draw upon when they were writing. It helped them to order events, and they were able to fill in what they did not know using their imaginations. The same recall, invention of new ideas based on the experience of game or role playing and 'gap filling' was exhibited in the spy activity.

In both the planning and the writing stages, children were heard discussing what had happened and the order that events had occurred. Having 'lived through' the experience, not only had the children memorised the sequence of events, but the experience also enriched their writing. Before the activities began, I had asked them to remember their emotions and changes to their bodies when they were scared or excited, and this was evident in their chat. Kinaesthetic memory helped with events and aspects of story writing that are often missed by young children. The chat led with comments such as 'I came round the corner, and the guard almost saw me, a shudder ran down my spine' (21Ap, 2009). A second comment was 'I started to shake with excitement when we set off' (11Es).

Kinaesthetic memory is similar to the concept of deep practice in which physically struggling to achieve something in a targeted way makes people more able:

> Deep practice is built on a paradox: struggling in certain targeted ways- operating at the edges of your ability, where you make mistakes- makes you smarter. Or to put it a slightly different way, experiences where you're forced to slow down, make errors, and correct them- as you would if you were walking up an ice-covered hill, slipping and stumbling as you go- end up making you swift and graceful without your realizing it. (Coyle, 2010: 18)

The concept of deep practice is reminiscent of kinaesthetic memory because the memorisation of how to do something is based on doing it, there is, however, one difference. The use of the word practice implies that the activity needs to be repeated,

becoming swift and graceful depends on the repetition of a physical exertion and that, in other words 'practice makes perfect'. Kinaesthetic memory in this study, was not built on repetition, in fact, if repeated too often, the activity would become mundane, ordinary and lose its appeal, the children would also remember less. In the context of this study, kinaesthetic memory comes from doing something novel, new and exciting just once, or at least not too often. Using kinaesthetic memory based on kinaesthetic activities children have the potential not only to work more efficiently without stumbling through the planning and writing stages but also to produce work that is richer, more realistic and more exciting.

Kinaesthetic memory seems to be in direct opposition to Descartes thesis of 'mind-body dualism' (first mentioned in chapter one). Descartes argued that the mind is completely detached from the body and that the mind did not need the body to exist. The concept of kinaesthetic memory requires a link between mind and body, the mind can recall the actions of the body and the body can form memories within the mind. This is supported by Rousseau in direct opposition to Descartes:

> Thus if children's learning is to be effective, it must be rooted in concrete experience. This seemed to echo Rousseau's conviction that learning by doing was to be preferred over learning by being told and suggests an order of priority for the relationship between language and thought- a question that has been at the heart of Western philosophical enquiry since Descartes. (Blundell, 2012: 130)

Learning by doing means that there must be a kinaesthetic element, the learner must move to 'do the work'. This would imply that the mind learns through the actions of the body, or through movement, which in turn means that kinaesthetic learning is just one way in which the mind and body are directly linked. In the next section, I will briefly discuss how kinaesthetic memory might be used in education.

### 7.7 The importance of kinaesthetic memory to story writing

The importance of kinaesthetic memory to story writing can be seen with reference to a well-known feature of Literacy work in schools (well known by all teachers of primary and secondary children). Primary students perhaps lack the independent learning skills and planning skills, in particular. The phenomenon is known as writer's block, it is not

however the preserve of children, it is also well known to adult writers and even to very successful writers. The writer's block has been described variously, as 'my block was due to two overlapping factors: laziness and lack of discipline'(Mary Garden, 2003)[20]. This, however, would not be wholly true of children, they were neither lazy nor did they lack discipline, I prefer the following definition, which is more of a true reflection of young children involved in this study:

> I think that writer's block is simply the dread that you are going to write something horrible. But as a writer, I believe that if you sit down at the keys long enough, sooner or later something will come out. (Blount, 2010)

A significant number of children in every class that I have taught find the art of writing very difficult. They find it almost impossible to start, however, once they have managed to start, some find that the writing process flows. Often children in both classes in this study would find writing difficult. They rarely found writing difficult however following one of the kinaesthetic activities.

The first kinaesthetic activity to which the children were exposed was the Warhammer role playing game. They collaborated to design a board game that they  then made and painted. The board could be designed in a number of ways, but the most popular was to have a track made of squares on the board, which might have been over a square metre. The squares would determine movement and often the children designed the board so that there were different routes that the characters might venture along. The boards were designed so that there were safe houses along the route as well as dangers, which might be orcs, dragons, gremlins or anything they chose. The children were taught and quickly picked up the Warhammer system of battling, and then they were ready to play. They could choose from a range of fantasy characters; they could design their own, or select from a warrior, a thief, a wizard, an archer and a dwarf. Each of these characters had special powers that they could use against the enemies they encountered along the route. The thief was very good at moving undetected, the warrior a great swordsman or woman, and the dwarf was immensely powerful. Each of the characters also had a special power that the children could create themselves such as being able to fly. These

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[20] Garden. M (2003) Author of: *The Serpent Rising: A Journey of Spiritual Seduction.* At  https://www.pinterest.com/pin/21110691976551639/

special powers could be used in times of danger or stress for the characters and were included to add variety and excitement to the story. The characters were similar to those found in the Lord of the Rings trilogy by Tolkien.

The children enjoyed designing the boards and the games; they also had to make their characters and enemies out of clay that were then fired in the school kiln and painted. Having completed the making stage, they had two afternoons to explore their games and perfect the play. At the end of the week, I asked them to plan a story based on the game. I told them that the board was the story line and that they could continue to play with it while they were writing; they had the board game and characters in front of them on their tables.

The children found the planning stage far easier than when they were asked to write a story after teacher input in the more traditional 'didactic' way. I recorded their comments as anecdotal evidence while they were playing. A typical comment was, 'I'm finding this easy, I can remember what I did, because we moved around the board' (8BeH, 2009). Another said, 'I'm not getting stuck on my writing, because I can think about what we did!' (12JSm). The children kept saying things that referred to knowing what to write next and how to plan their stories on the basis of having played and remembered the events. There was extensive discussion of the story of the adventure that their characters had. I frequently heard children while they were collaboratively planning their writing make comments such as 'What happened next?'(12Sm), 'What did we do then?' (24Em) 'Oh yes, I remember and what's going to happen now?' as well as 'There might be an attack of evil Orcs if we roll a six on the dice' (27M). Though Confucius lived a long time ago, his words were echoed in those of the children. Confucius would have approved of the incorporation of the third strand, kinaesthetics, into teaching practice.

### 7.8 The application of kinaesthetic memory

Kinaesthetic memory helps to prevent writing block, when a child says 'I don't know what to write next.' The activity stimulates their imaginations, and the children 'live the experience'. Following a stimulating activity, they can create a story line in their heads and follow it from the memory of having lived through the events. The story line

appears to be imprinted on the memory. The real advantage to the child of this process is that they do not suffer from the problem of the memory block or writer's block, where they cannot think of what to write next. It also has the advantage of helping them to write using their senses, thoughts and experiences, enriching the writing produced, as a result.

## 7.9 Emotional Contagion

Another important aspect of the this work is that of emotional contagion. In common with kinaesthetic memory, emotional contagion emerged from the responses of the children. It was also apparent when I was watching the children when they were actively engaged in the activities. The excitement generated was the result of working together and the excitement and emotions were transmitted from one to the other and between groups. I will begin with a definition of emotional contagion.

> Emotional contagion is best conceptualised as a multiply determined family of social, psychophysiological, and behavioural phenomena. Theoretically, emotions can be "caught" in several ways (Hatfield *et al*, 1994: 7).

The term 'multiply determined' refers to several ways in which emotional contagion can be induced. It can be produced by innnate stimuli such as a mothers expressions towards her infant, or the stimulus could be acquired or they could be mental or emotional stimuli.

Mechanisms through which emotional contagion occurs are suggested by Hatfield et al (1994: 15), 'emotional reveries may be read in the resulting facial, vocal, and postural expressions, automatic nervous system (ANS) activity, and/ or instrumental actions'. The transmission of emotions between individuals is, according to Hatfield et al (1994: 7-11) through four mechanisms:

- Conscious cognitive processes.
- Conditioned emotional responses.
- Unconditioned emotional responses.
- Mimicry/ feedback.

Conscious cognitive process involves imagining that one is in the place of someone else, for example a man on the rack. People are able to imagine themselves in the place of the tortured man, they can imagine the pain. In a subject whose imagination was powerful, the emotions could alter, even the physiology including the heart beat. This mechanism of emotional transfer 'would be expected to be an especially potent determinant of emotional contagion when individuals love, like, or identify with others or share their goals' (Hatfield at el, 1994: 9).

Conditioned and unconditioned emotional responses are the result of more primitive processes. A conditioned response can be seen in Pavlov's dogs, where Pavlov noted that the dogs salivated when they saw the technician that fed them, not when they saw food. An example of an unconditioned emotional response is the response that most people have to a screeching chalk on a board. Conditioned and unconditioned responses might happen at the same time, and together:

> Conditioned and unconditioned emotional reactions may act in concert. For example, the mere sight of facial expressions or postures previously associated with angular movements, shrill, high-pitched voices, or intense vocalizations and movements may come to evoke comparable emotions in observers. (Hatfield et al, 1994: 10)

The mimicry or feedback mechanism through which emotions are transmitted has received less attention than the former three mechanisms. Hatfield et al (1994: 10-11) offer three propositions where the mimicry of feedback of emotions occurs.

- Propostion 1. In conversation, people tend automatically and continuously to mimic and synchronise their movements with the facial expressions, voices, postures, movements, and instrumental behaviours of others.
- Proposition 2. Subjective emotional experiences are affected, moment to moment, by the activation and/ or feedback from such mimicry.
- Proposition 3. Given propositions 1 and 2, people tend to "catch" others' emotions, moment to moment.

There are a variety of methods of transmitting emotions from one person to another, some of which are capable of transmitting emotions automatically. It would appear, that

we are both programmed to transmit and receive emotions and that some mechanisms are innate, others learned. It is possible that in this study all of the mechanisms were in operation, but I would propose that conscious cognitive processes were certainly involved, because the children involved had a common goal in each of the kinaesthetic activities.

In the context of this work, emotional contagion was exhibited when a group of children were actively and purposefully engaged in exciting kinaesthetic or practical work, they become more interested, and motivated; as a result, they learn more effectively than they would had they merely sat in class. The learning is also more meaningful and memorable; the work becomes a living experience.

### 7.10 Evidence for emotional contagion in this work

The starting point for the idea was the anecdotal evidence in my field notes. As with the kinaesthetic memory, time and time again, I kept hearing the same things. Examples of things that I heard were 'this is so much fun, it's the best work ever' (22Sm, 1As, 20Sj, amongst others). They constantly asked the same questions, 'can we do this again?' and 'will we do more work like this?' It was clear from the positive comments, unlike those usually heard by me in my teaching that the children were enjoying the work immensely. The excitement in the spy module (which lasted just over a week), built from the first day, when they donned their expendable clothes and crawled through the woods. They had to try to take a document from beside a tree without making a sound. I was the guard and stood behind a tree, only to emerge if I heard something. The objective of this was for the children to learn stealth.  The second-day involved code cracking and began in the classroom, and each group of between three and five had a code wheel. The code wheel (that can be viewed in appendix five), consisted of two cardboard wheels the outer larger than the inner. The two wheels were attached at the centre by a split pin so that the two circles were free to move. The alphabet was set out on both wheels, and they had to set the wheels so that A on the inner wheel matched E on the outer wheel. Codes were read on the outer wheel and were read by converting back to the inner wheel. Having cracked the codes, the children could move on to the next because the code included the location of the next code. At the end of around nine codes placed around the school, the children would learn the location of a key which

would allow them to gain entrance to a hitherto locked storeroom. Having gained entry, they were required to photograph a secret document hidden within the room and show me the evidence to prove that they had achieved the mission. Most succeeded, and those that did not all but refused to go out to play or to dinner until they had accomplished the mission. The learning objective was to crack codes so that some secret element could be included in the story they would later write.

Day three involved the children designing and making a spy secret weapon or artefact. The weapon or artefact might have been invisible ink made from things like lemon juice or a periscope, used to see around corners. There were volunteer guards patrolling the corridors to try to catch out children who were too noisy or lacked stealth. From this, it was hoped that not only would the secret weapon work, but also that they would experience the excitement of trying to avoid the guards. The fourth day saw two sets of guards who patrolled various areas of the school and school grounds. The children were required to move about extensively to achieve their mission. Day four like day three involved the excitement of avoiding the guards, but for this. The difference however was that they also had to enter the staff room, and photograph a secret document. At the end of day four, they were asked to record some of their emotions and feelings so that they would not forget. On day five, I introduced them to a map of a mansion and its grounds; they were told that this was their objective for the story they were about to write. The map had a number of obstacles, including a river, guards and dogs that had to be avoided. In effect, the map was to be the storyline; they could use their experience of the week and imagine their journey across the map and breaking into the mansion to discover some secret.

Most children in the study felt that this was the most exciting module of work, and it was from this that the notion of emotional contagion emerged. There were constant calls of unfairness by those caught by the guards and allegations of cheating. They soon turned around and started again, so that they soon forgot the complaints. At times, the level of excitement threatened to disturb colleagues working in other classes. As a result, learning support assistants (LSAs) had to be well placed to remind pupils that they were spies. I kept hearing the same comments time and time again, 'quick, quick they're coming,' (meaning the spies), or 'run, run! We can make it'. By the way, as well as the excitement, there was a lot of collaboration between the groups; children helped

each other. My field notes record comments like, 'go that way; I'll distract them' (10Y), or, 'it doesn't matter who gets through just so long as one of us does!' (16N). The idea of emotional contagion grew from the level of excitement. The activities were both collective and social because if was one child on their own, they would not have had the same level of excitement. For children to become that excited by an activity, the experience had to be shared. Once the idea of emotional contagion had developed, as with the first element of the theory (kinaesthetic memory), I had to triangulate the idea, in the same way. I used the same 'tools,' anecdotal evidence, questionnaires and interviews to triangulate the idea. As stated in chapter five, the questionnaires and interviews were only undertaken in the second year of study.

Above I discussed the social nature of learning, how it is a collaborative exercise. In the present study, all of the activities were group activities that required the co-operation and collaboration of all of the children. To succeed the children were required to work together to solve problems and to decipher information. The most successful activities also used the paradox that, operating on the edge of one's ability makes us smarter. This is similar to the concept of 'deep practice' discussed by Daniel Coyle (2010:16), where the reader is invited to memorise two lists of words. The first list has pairs of complete words; the second has paired words, one complete, the other fragmented. Studies have shown that people remember three times as many words in the second list as they do the first. This is accounted for by the struggle involved in learning, it is not just true of memorising lists of words, but it is true of all types of learning:

> You didn't feel different. You weren't touched by genius (sorry). But when you encountered the words with blank spaces, something both imperceptible and profound happened. You stopped. You stumbled ever so briefly, then figured it out. You experienced a microsecond of struggle, and that microsecond made all the difference. You didn't practice harder when you looked at column B. You practiced deeper. (Coyle, 2010: 17)

Although the example above is not an example of a kinaesthetic activity, the essence of what is said is relevant to emotional contagion. The kinaesthetic activities involved a struggle to achieve their goals, a struggle to accomplish their mission. It was the sense of urgency and the need to persevere involved in the struggle that resulted in the learning experiences being so 'ingrained' and incised into their memories. Activities should wherever possible, include something new, somewhere they have not been, a

locked room, a store cupboard, or an area behind a locked gate. There should be a time limit so as to increase the sense of urgency and competition between groups. It is interesting to note, but not perhaps unexpected that groups that had internal competition tended to fail and not solve the problem. The most successful groups had internal collaboration but thrived on the inter- group competition. Several children reported the problems with other groups and could see the problems that resulted from the lack of co-operation by group members. 'They were arguing all the time, we got on well and we won' (29Hk, 2009). The same problems were reported in the second year of study, 'their group argues all the time, they make so much noise that the guards got them' (2To, 2010). Unexpectedly some children were not competitive, they were clearly trying to complete the task just because they wanted to find out the result irrespective of who came first or who 'won'. 'I wanted to get to the end to find out what it was' (18Ea, 2010). Another child said 'I really wanted to see what it was in that room' (26So, 2010).

The nature of this study made the findings differ from Durkheim's. While his subject matter was the idolatry of primitive tribes, this study focussed on aspects of learning of children in a developed society. Durkheim argued that rituals resulted in the 'grounding' of religious beliefs, thoughts and ideals. Grounding is achieved where members of a group gather to perform religious rites:

> For Durkheim, the central feature of these gatherings is that they are 'effervescent' assemblies in that they generate heightened and mutual emotional arousal from the collective performance of various ritual practices. (Pickering, 1984: 385)

The present study is not concerned with ritualistic practices; it is based on the learning of children taught kinaesthetically. Emotions were often aroused by the activities in common with those of the participants in the ritual practices. 'It is the collective effervescence stimulated by assembled social groups that harness the people's passions to the symbolic order of society' (Shilling and Mellor, 1998: 196). Further to collective effervescence, it has been argued that individuals in a society have shared emotions. 'The key process is participants' mutual entrainment of emotions and attention, producing a shared emotion/cognitive experience' (Collins, 2004: 49). Emotional contagion differs from collective effervescence in terms of emotions because there was not just one emotion reported, the activities generated a range of emotions. Some

children became angry due to what they perceived as cheating or unfairness. One child complaining about the role of the guards said 'It's not fair, they're just waiting around the corner and they're not patrolling like you said they had to'! (26L, 2009). A second child became angry when she reported ' they're all waiting in the storeroom and it's not like real spies, they're not being fair!' (18Zl, 2009). A guard complained 'I caught 3Ab and 6Ma but they refused to be out, but I got them, but they said I didn't and they're cheating' (25Ca, 2010).

A frequently experienced emotion was that of excitement, an emotion they found it difficult to hide. Having accomplished the mission that had lasted an hour and a half and involved a range of activities, many raced back to report their findings. One group containing five children who were the first to accomplish the mission ran back excitedly to show me a photograph of the spy plane (the secret document):

> Look at this, this is it; we've got it! We were the first to do it, and we didn't get caught! (15Rm, 2009)

The same emotion was apparent in the second year of study. The task generated a sense of real excitement for some, but not always for all. The children experienced a range of emotions in the course of doing the work. The emotions experienced included frustration when they couldn't crack a code, disappointment when they thought they might not complete the task and confusion when they had decoded a code word or sentence incorrectly. Some children showed a real desire to achieve the task, 'I just got to get to the end, I just want to see what it is' (24Em, 2010). Other children even showed envy when they had not achieved the task but others had. This could result in a very negative emotion such as sadness and in some cases this was so apparent that I allowed some children who had not completed the task to try again the next day. Emotional contagion is capable of generating the full range of emotions not just within a group, but also within one child in the course of the ninety minutes that the task took.

The theory of emotional contagion was evident in the activities and it was apparent in the words of the children in their responses to interviews. Altogether I conducted seven interviews to ascertain the views of the children about the work overall. The children completed the questionnaires independently, but as previously stated, I am aware now

that I did steer the responses of the interviews towards my goal, displaying researcher influence. The children interviewed were WM1, ON7, 12J, 25Ca, 2To, 28Aa and 9JF (see appendix 16), all of whom mentioned at some point that they were excited or that the work was exciting. The idea of emotional contagion came from the children themselves, but it was also evident by just being around them while they were spies. The excitement was very apparent.

## 7.11 The fusion of kinaesthetic memory and emotional contagion

Kinaesthetic memory, or muscle memory according to Syed and Coyle, are memories stored in the brain and the central nervous system. For them, kinaesthetic memories are the result of repeated actions, or constant practice. Kinaesthetic memories in this study were the result of a single event, not one repeated time and again. The kinaesthetic activities created a level of excitement that passed between the children and caused emotional contagion. It would appear that the contagious emotional excitement created memories that were so memorable that they needed to be acted only once. The fusion of emotional contagion and kinaesthetic memories offer a powerful tool for the creation of strong memories that might potentially help children to write from experience. When children write from experience, they have the potential to include features they might otherwise have omitted. Emotions, thoughts, sequenced events, what happens to the body through emotions, such as sweaty palms, goose bumps and spine tingles, are some of the features that were found in writing in this study. The findings of this study do not mean that such features cannot be included by children when taught through other means, but using the fusion of emotional contagion and kinaesthetic memories results in a lived through experience that makes their inclusion highly likely.

It is interesting that when discussing the mechanisms for emotional contagion, Hatfield et al (1994: 33-34) discuss muscle mimicry. They reported that muscle movements can track thoughts:

> When we daydream about a painting or eating an ice cream cone, we can, if we pay careful attention, sometimes notice small muscle movements tracking our thoughts.

Hatfield et al also postulate that it is possible if not probable that people imitate each others actions and muscle movements. An example of this would be an infant imitating its mother opening and closing her mouth when feeding the baby. 'When we carefully attend to others performing a series of manual activities, we find our own muscles "helping them out" (Hatfield et al, 1994: 32). This might have played a part in the fusion of kinaesthetic memories and emotional contagion.

## 7.12 Summary

A class of children, organised and with a common goal, can achieve more meaningful and memorable learning than a child sitting, learning alone. The fusion of kinaesthetic memory and emotional contagion might offer an important tool with which to enthuse children in schools at a time when methods have returned to those of the 1950s. Not only are some of the methods used those of the 1950s, but also the government philosophy is at least in part, that of the 1950s with the call for a return to grammar schools.

The three strands of this thesis remain vitally important to educational practice. Children learn more through social interaction than sitting quietly, they learn more by doing than being shown and they learn more when teachers focus upon the cognition of pupils. In chapter eight, I will discuss the three strands in more detail: the social, the cognitive and the kinaesthetic. I will also consider the limitations and recommendations of this research.

# CHAPTER 8

# REVIEWING THE LEARNING PROCESSES

## 8.1 Introduction

What began as a study of the effect of kinaesthetic teaching upon attainment in story writing grew and developed into something very different from what I had envisioned at the start. When I began the study, I believed in the virtues of VAK and valued the contribution of the learning style to teaching and learning. I soon questioned VAK and eventually rejected the importance of what I came to believe was a description of how we take in information through our senses. As a result of conducting this research, not only did my whole practice change but also my attitude and approach to the children. I began the present study as a teacher who (to quote popular teacher talk) 'filled heads with ideas, methods, theories and beliefs'; I ended this study as a teacher who learned as much from the children as they did from me, if not more. I now value the ideas comments and contributions of the children far more than I ever did.

In this chapter, I will conclude the research and discuss the errors that I made, some possible improvements along with its findings. I will begin by discussing the findings through the three strands of the research, the social, cognitive and kinaesthetic strands. Later in the chapter, I will discuss the recommendations including the nature of future research which should take place in the light of the findings of this work.

## THE THREE STRANDS OF THE RESEARCH

### 8.2.1 The social strand

The first strand of the research was the social strand, which drew upon the work of Vygotsky and the Reggio Emilia approach amongst others. The surveys completed by the children show that they learn from each other more readily at times than they do from the teacher, when they engaged in peer support, or children act as learning mentors. Social factors in cognitive development were considered by researchers such as Bandura (1986) and Piaget (1950) but Vygotsky (1978) emphasised the individual development within the social setting. Much of the learning in this study and more widely the educational experience would have been impossible had the pupils been

taught separately or in isolation. Emotional contagion and kinaesthetic memory emerged from the comments made by the children and the fusion of these theories might be a method that could be used to improve writing. Emotional contagion can only occur where children are working in large groups; the level of excitement generated would be more difficult if not impossible to achieve for a small group or a child working alone. Work that is conducted with the class arranged into groups creates an element of competition between groups but co-operation within the individual group. The importance of the social impact on the education of children and in particular of the social influences on cognition can be summarised as:

- In this study, the MKO, teacher or peer is influential in the cognitive development of the individual.

- The student's attitudes and beliefs are determined by the culture and the immediate social influences both within the school and the wider community.

- Language, a shared social concept, is the means through which sociocultural factors impact upon the individual.

- Student centred teaching allows children to progress towards learning objectives and construct knowledge through social interaction (Tudge and Winterhoff, 1993).

Social aspects of the work proved to be stronger than I had initially thought they would be. The children repeatedly mentioned the importance of working together in the questionnaires and interviews. The 2010 class entered year six with a number of social issues but left year six 'getting on with each other'. This was the result of this work in which they were required to work together so often that they grew to accept and like each other over the course of the year. The organisation of the work that required the children to work in groups resulted in them further developing their social skills.

### 8.2.2 The Cognitive strand

The children's responses to the questionnaires showed that they enjoyed this type of teaching and learning, where they learned by 'doing'. Kinaesthetic teaching in this study, was good practice and the children enjoy this form of learning, it also helped the children to write stories that in the context of this study were more imaginative. The

learning style preferences claimed by the children are not fixed. Approximately 33% or one third of the children surveyed showed some level of consistency in their claimed learning preference. The changing nature of learning styles was supported by Lafferty and Burley (2010) who stated that:

> An individual's learning style is not fairly stable across tasks, etc. It is topic dependent as Curwin showed (Curwin, 1992) or people just assume it is static and not topic dependent. (Lafferty and Burley, 2010: 11)

This might evidence an evolution in the learning styles of some children, or it might mean that some are randomly choosing from the multiple choice selections.

The children quickly developed the role of experts, eventually, they planned their lessons and contributed to the development of the kinaesthetic lessons used in this research. I continued to use the method after the two year period of results, and they became part of my practice and that of other members of the teaching staff. The children's suggestions contributed greatly to the method; the murder mystery began as a large game of Cluedo with the rooms marked out on the floor with masking tape. I had made the cards and artefacts, and the children worked in groups using a large die to roll movement, each pip on the die represented 30 cm movement between rooms. Having encouraged the children to become experts and to give their opinion, a group of girls approached me at break time after the game. The girls said 'I enjoyed the game, but it was a bit boring at times, and we think that we could make it better (16N, 2009). Another girl added: 'we think that we could have done it like a real murder mystery, like a dead body in the room, not a real one but an outline like on the films' (15RM, 2009). I asked them to plan their suggestions at dinner time, which they were happy to do along with two others. They planned a four-day murder mystery that eventually led to the identification of a suspect and a mock trial in which children took the roles of judge, prosecution, defence, suspects and jury. Being able to contribute to lesson plans also increased the confidence of children, their self-esteem rose as a result. The children's self-esteem increased, and by including the children in the planning of their work, their motivation also increased. In this study, the children became active participants in designing learning activities, something that further increased their interest and self-esteem.

### 8.2.3 The Kinaesthetic strand

In the two years of testing, 38% (2009) and 46% (2010) of the children taught improved more than the expected two parts of a level. The Wilcoxon Signed Rank test showed, the average improvement was 2.31 (St. Dev 0.71) parts of a level for 2009 and 2.5 (St. Dev 0.96) parts of a level for the 2010 cohort. The Wilcoxon Signed Rank test showed that this improvement was significant. This means that in this study, just under half of the children improved significantly more than expected. I cannot say that the improvement of the children was due to kinaesthetic teaching. It is impossible to measure or to isolate the contribution of kinaesthetic methods of teaching from the multitude of other factors that helped the children to learn. The intake for 2009 was considered to be a 'dip year' in other words, they were considered by the school to be a year that would not perform as well as other years. I found that the improvement measured in this work could not be attributed to one learning style, the claims of a learning style by the children could not be relied upon. I found that I could not rely on the claimed learning style made by the children because this changed over the year, but it would appear that using this teaching style would not disadvantage any type of learner.

In the years since the collation of the data for this work, I have increased the number of kinaesthetic activities. More recently I was working with a number of year sixes on nets in maths. The children complained that they just did not get them. Though this is outside the period of testing, the data is relevant to the study so it is included (and the children identified by initials). 'I don't get nets; I just don't understand them' (MR, 2013). 'Nor me and we've done them lots of times, I just can't see them' (AD, 2013). The problem was that nets had been taught as a paper exercise using drawings, and this had little relevance to the children. I decided to get them into groups of two or three and ask them to use nets to make an object such as a ship, plane robot or person. This is not new nor is it revolutionary, but it shows where the emphasis should lie, teachers must apply concepts being taught and allow the children to learn by doing. The children worked on their models for two to three hours and by the end of the exercise, the response was very different. 'Now I understand, I can see which nets make which shape and how they fold to make the shapes' (MR, 2013). 'I wish I'd done this sooner I didn't understand when we did it on paper' (AD, 2013).

### 8.3 The importance of the findings

The findings are important for three reasons. Firstly, I found that in this study, children could not be reliably labelled as a certain type of learner. Labelling might affect the way they see themselves, and their claimed learning style in this study changed. The children did not keep the same learning style over the period of a year. Secondly, the fusion of kinaesthetic memory and emotional contagion might offer a more fun way of learning and a means of overcoming writers block, enabling children to write more imaginatively and enthusiastically. Thirdly, children enjoyed the method of teaching in this study. As a result, it makes school more fun so that children want to attend school and enjoy it once they are there.

### 8.3.1 Why are the findings original?

- The study tests the claims of VAK proponents and shows that not all children keep the same learning style. Although there have been proponents of VAK that have implied or intimated that VAK is innate and genetically determined, no one had published work that showed that the VAK learning styles of children remained the same at the time of writing this thesis. There has also been no published work when the present work was completed that showed the opposite, that young children changed their preference for VAK over a period of time such as a year.

- It offers an insight into the way in which children would like to be taught and how they can enjoy school. Children are rarely asked about their opinions about what form of learning they enjoy. This work affords an insight into the way that children would prefer to learn if they were given the choice. Almost all of the children reported a preference for practical learning; in essence, David Kolb's experiential learning.

- The thesis fuses together two concepts, kinaesthetic mind memory and emotional contagion. No work published at the time of writing this thesis has claimed or recognised the fusion of these concepts. The kinaesthetic activities outlined in this work created the contagious excitement that resulted in the formation of kinaesthetic memories in the minds of the children involved. The formation of kinaesthetic memories helped the children overcome the writer's block.

## 8.4 The role of learning theories

The findings of this research rejected the idea of a fixed learning style; it found that children did not choose the same learning preference consistently, in addition, few children reported strong learning preferences. The existence of learning styles is still a hotly debated topic with authorities on both sides of the argument. While Kolb proposes the experiential learning theory (ELT) using terms such as activists and reflectors, Clark (2007) argues 'there is no scientific justification for any of these terms'. These findings were soon supported by the work of authorities who had come to the same conclusion prior to the findings of this research. It could be argued that VAK should be rejected never to be mentioned again because it has no foundation in fact. The findings of this work would support such a rejection. There is one proviso however, and that is that an awareness of VAK by educationalists can and should be used to inform their planning as it is in the study school. The advantage of keeping VAK for planning work activities and lessons results in the need for the teacher to think about how information is delivered to the children. I am not claiming that this will allow access to various learning preferences but it would make lessons more interesting and stimulating. It would result in the delivery in a variety of ways, one of which is likely to be accessible to the children. If they are not listening, they might pick up the concept or new idea from the following visual presentation. Should they not access this form of delivery, a kinaesthetic activity would present another opportunity to learn.

The debate about whether learning styles exist or not will eventually be decided by the community of enquiry. Even after such a decision we cannot necessarily argue that the 'truth has been found.' Often the community of enquiry bases its findings on the 'weight of evidence', even this has been shown to be erroneous in the past:

> Models are to be questioned and if they are 'wrong' then the models are to be changed. This is what the scientific method is all about. 'Wrong' can mean many things, like 'the weight of evidence', but even that can be in doubt when the ancient Babylonians said 'the earth is flat', and the weight of evidence said that the earth was flat, but it isn't. 'Wrong can mean the output from the model does not conform to what we see. (Lafferty and Burley (2009, 2-3)

Often, even when a theory or an idea has been refuted by the community of enquiry, there are those who refuse to give up the theory or belief in the theory. An example of

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such a refusal is 'there are still 'flat earthers' who believe that the earth is flat.' It might be that even when all learning theories have been comprehensively refuted by the community of enquiry there are still adherents who refuse to give up on them.

### 8.5 Applications of kinaesthetic research to other areas of the curriculum

Through this research, I have become a proponent of the kinaesthetic method. Since I began this study, I have expanded its use into other areas of the curriculum as mentioned above. I now use the methods in mathematics; maths has become more creative than it ever was for me; it is now a place where children learn maths through practical activities as well as narrative or story settings. To give an example, one maths lesson for year four involves a holiday; the children and their parents are going to Florida. I arrange the room into five clusters of tables, typically with seating for six children around each. The children move in the groups of tables carrying out a range of activities.

On the first table, the children must weigh their clothes. I tell the children the weight limit, and they must pack only what they can fit into a small suitcase. In the suitcase activity, the children learn about weight. They must add the weight going along and ensure that it is below the weight limit they are allowed. The activity uses small suitcases and cardboard cut-out clothes, so they can move the clothes around and total different items. On the second table, the children have a series of timetables graded according to ability; they calculate the flight time to different destinations using the timetables. The third table has a beach setting; a painted scene is placed on the table, some sand and shells for realism. They are told that they have forgotten their belongings and only have £10, and must calculate the cost of the items they need. This is an activity designed to develop their number work through money. On the fourth table, they are at the funfair and some rides made from card add to the activity. Through this activity, they learn about shape and must identify shapes in the structure of different rides. Finally, they are at a restaurant in the evening, where they buy and share pizzas; this is to calculate fractions of pizzas that each has.

I use the method in other areas of the curriculum as well, and will elaborate on just one more example, due to limitations of space. This example highlights the collaborative

nature of the method of teaching used in this research. When studying world war two, the children are given a full day to make a suitcase for an evacuee. The activity is after a lengthy period of study and a research project so that they know a considerable amount about the period. They are asked to plan their day themselves, on the one proviso that each child must make something, and each must write something. Apart from that and the obvious safety consideration, there are no rules. Mothers are asked to help in the class, as well as a learning support assistant (LSA). The children are required to make a net then for the suitcase, large enough to hold all of the artefacts they are going to make. They are required to make toys out of wood, such as a toy train or toy doll. Making the toys involves sewing skills for clothes for the child (not life-size) or the toy doll, and sawing and drilling skills when cutting wood to make the toy train. Other artefacts that have been made include wooden yo-yos, noughts and crosses, picture frames and gas masks amongst other items. Having made the artefacts, they need to paint the toy trains or lorries and suitcases. Later, they are required to put straps on the outside of the suitcases and stickers from different locations to imitate a well-travelled case.

The children work collaboratively in groups so while some are making artefacts, others are making the net for the suitcase and still others are writing. They are asked to include a variety of writing in their suitcase, all written on paper, previously stained by tea to give the appearance of age. They are asked to write letters to and from mum or other relatives relating events from world war two. Other forms of writing are a world war two song book, recipe books, a mock ration book and a newspaper front page as well as other items.

The teaching method used in this research combined kinaesthetic methods at times with the MoE, the two work together well. The inclusion of 'props' and other materials is not necessarily a part of the MoE method, although Heathcote did encourage children to record ideas on things such as maps as part of the drama method. The advantage of using kinaesthetic methods is that the work is made relevant to the children and more accessible. Learning, as a result, is improved. The major disadvantage of using these teaching methods is that they require an enormous amount of time to plan and prepare as well as a lot of imagination to generate ideas. The time required, however, is worth the result in terms of the learning of the children, which is the aim of education.

## 8.6 Limitations of the research

It was not until it was too late in the process that I realised I had missed an opportunity to improve my research design. I was asked the question, 'why did you not you use the cluster schools as the control?' The cluster schools are schools within the area of the school in which I carried out the research (as explained in chapter one). Had I conducted the research in this way, the findings would have held more credibility. In truth, I had not even considered using the cluster school group, and yet, once mentioned, it seemed so obvious! I should have used the cluster group information far more than I did. To summarise what would have been a better method, I should have taken the performance of the local schools before testing began, and compared their performance with the research school (my school). I could then have obtained a baseline, a starting point for the research. I could then have carried out the kinaesthetic teaching and tested the research school compared to the cluster schools and measured the amount of improvement. My findings could then have applied to the cluster schools and might have been relevant to them. They, too, might have been able to raise attainment.

The advantage of involving the cluster schools would have been significant. Unlike the national average that was used as the comparison against which to measure improvement, the cluster schools have much in common with the research school. The demographics are largely the same, although there are some variations within different schools in the area. The socioeconomics are largely the same; the cluster schools are all from the same town. There is the same level of poverty or affluence, similar numbers of free school dinners, similar occupations of parents. In short, by taking the cluster schools as the control, I would have been comparing like with like. However this possibility did not appear to me when I was in the planning stage of the methods and research design.

The sample used in this study was small (N=57); therefore the findings derived from the research must be taken with caution. A second limitation was that the work was carried out in just one educational establishment. To ensure the validity of any findings further research using a greater number of participants would need to be carried out preferably in more than one study school.

The teaching methods used were a combination of Mantle of the Expert and kinaesthetic practices, and I devised the lessons. It might be that the methods worked because of me and my enthusiasm. It might have been my love of the subject of story writing taught in a practical way that enthused the children to work hard and perform well. This can be discounted to some extent by the results derived from the other class (the study school is a two-form entry). Both classes used the techniques when learning about story writing. The results for level 5s were split between the two classes, with an average 5-10% difference between the two classes. The number of children not reaching the expected grade (level 4) was also not significantly different. These results would suggest that it was not the enthusiasm of one teacher, rather it was the techniques used in this study that improved the standard when compared to the national average expectation.

Throughout this study, I have made a number of errors, many were not apparent to me until the work was almost complete and had been read by others. When conducting research, the researcher is often too involved to have an objective eye. Another error that I made was in the design of questions used in the questionnaires, some were leading. I sometimes led the child when I asked questions, but at the time I was not aware that I was leading them. Problems will be encountered in all research, the important thing is to learn from them, which I certainly did.

### 8.7 Further research

The findings of this research suggest that more research is needed. The finding that kinaesthetic teaching mehtods used in this study improves the children's performance by between 0.31 and 0.5 parts of a level (for some of the groups involved) should be further substantiated. In new research, the research school should be compared to its cluster schools. The average improvement should be measured before the period of the research begins. The results of the research school should be compared to the average improvement of the cluster schools. Kinaesthetic teaching methods used in this study should then be used in the research school for a period of approximately two years and the average improvement measured again. A finding that the average improvement of the test school was between 0.31 and 0.5 parts of a level more than the cluster group

average would indicate that kinaesthetic methods improve the children's learning significantly.

As mentioned in the above, to improve the validity of the findings, the research should be carried out involving a wider range of schools, and it should include a larger number of individuals. Ideally, the research could involve the member schools of a cluster group, with half using the techniques and the other half not.

Research into the use of Mantle of the Expert and kinaesthetic methods should be conducted into areas of the curriculum outside of the story writing which was explored in this study. The use of both teaching methods could be explored in maths, history, geography, and science. At the time of writing, the levels in subjects other than some areas of Literacy and Maths are in the process of being discarded. Any improvement should be in terms of qualitative factors such as pupil questionnaires asking about levels of enjoyment or motivation.

The findings of the questionnaires, that the children enjoyed being taught using the methods in this study, could be tested in other schools. It is impossible to separate my influence from the methods. If children in other schools reported that they enjoyed the teaching methods, they could be used more widely. The fusion of emotional contagion and kinaesthetic memory might result in other children enjoying school more and in their overcoming writer's block.

### 8.8 Summary

The use of learning theories should be treated with care, VAK should not be used as it was at times in 2008-9. In 2008-9, children were tested, told their learning style and advised to learn according to that style. In future, there might well be other learning theories generated through educational research; these too must not be thrust upon children unless and until research has been conducted into their benefits. I do not however propose that VAK should be discarded entirely; there is one real benefit of the theory. When planning lessons at the study school, teachers are still required to show how ideas will be taught to the children, and VAK is still included in the lesson plan. The advantage of its inclusion is that teachers are required to think about how they

deliver information to the children. The inclusion of VAK makes lessons more interesting for the children because information and concepts are delivered in a variety of ways not just through 'chalk and talk'. The emphasis should however be upon the kinaesthetic aspect of teaching. The need to plan for kinaesthetic learning may pave the way for more children to witness the benefits of the fusion of kinaesthetic memory and emotional contagion as described in this study.

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## The VARK questionnaire

The VARK questionnaire can be found at:

http://www.vark-learn.com/english/page.asp?p=questionnaire This was read to the pupils and some of the questions were modified or explained to make them more relevant to their age group for example, the third question (about the tourists) was explained as visitors to the school.

The VARK Questionnaire

**How Do I Learn Best?**

Questionnaire version 7.1

Choose the answer which best explains your preference and cross the box next to it. **Please cross more than one** if a single answer does not match your perception. Leave blank any question that does not apply.

**A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:**

watching the actions.
reading the words.
listening.
seeing the diagrams.

**You have finished a competition or test and would like some feedback. You would like to have feedback:**

using graphs showing what you had achieved.
using examples from what you have done.
using a written description of your results.
from somebody who talks it through with you.

**A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:**

take them to a park or wildlife reserve and walk with them.
give them a book or pamphlets about the parks or wildlife reserves.
show them maps and internet pictures.
talk about, or arrange a talk for them about parks or wildlife reserves.

**You have a problem with your heart. You would prefer that the doctor:**

used a plastic model to show what was wrong.
described what was wrong.
gave you something to read to explain what was wrong.
showed you a diagram of what was wrong.

**You are planning a vacation for a group. You want some feedback from them about the plan. You would:**

give them a copy of the printed itinerary.
phone, text or email them.
describe some of the highlights they will experience.
use a map to show them the places.

**Remember a time when you learned how to do something new. Avoid choosing a physical skill, eg. riding a bike. You learned best by:**

watching a demonstration.
diagrams, maps, and charts - visual clues.
listening to somebody explaining it and asking questions. written instructions – e.g. a manual or book.

**You are helping someone who wants to go to your airport, the centre of town or railway station. You would:**

go with her.
tell her the directions.
write down the directions.
draw, or show her a map, or give her a map.

**Do you prefer a teacher or a presenter who uses:**

question and answer, talk, group discussion, or guest speakers.
demonstrations, models or practical sessions.
diagrams, charts or graphs.
handouts, books, or readings.

**You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:**

clear written instructions with lists and bullet points about what to do.
many examples of good and poor photos and how to improve them.
a chance to ask questions and talk about the camera and its features.
diagrams showing the camera and what each part does.

**I like websites that have:**

things I can click on, shift or try.
audio channels where I can hear music, radio programs or interviews.
interesting written descriptions, lists and explanations.
interesting design and visual features.

**You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?**

The salesperson telling me about its features.
Trying or testing it
Reading the details or checking its features online.
It is a modern design and looks good.

**You have to make an important speech at a conference or special occasion. You would:**

gather many examples and stories to make the talk real and practical.

write a few key words and practice saying your speech over and over.
write out your speech and learn from reading it over several times.
make diagrams or get graphs to help explain things.


**You are going to choose food at a restaurant or cafe. You would:**

look at what others are eating or look at pictures of each dish.
choose something that you have had there before.
listen to the waiter or ask friends to recommend choices.
choose from the descriptions in the menu.


**You are going to cook something as a special treat. You would:**

cook something you know without the need for instructions.
use a good recipe.
ask friends for suggestions.
look on the Internet or in some cookbooks for ideas from the pictures.


**You want to learn a new program, skill or game on a computer. You would:**

use the controls or keyboard.
talk with people who know about the program.
read the written instructions that came with the program.
follow the diagrams in the book that came with it.


**Other than price, what would most influence your decision to buy a new non-fiction book?**

A friend talks about it and recommends it.
Quickly reading parts of it.
It has real-life stories, experiences and examples.
The way it looks is appealing

# Appendix 2 The questionnaire used to assess pupil metacognition / motivation

## Some of the questionnaires about spy work

### Questionnaire about spy work RE4

**Q1. What do you remember about the spy work?**

I remember doing code cracking using a spy wheel. This was a very amazing but hard to get past the teachers. Also other codes.

**Q2. What was it like being a spy?**

Being a spy was very hard since all of the teachers were told, if they see us they send us back.

**Q3. What did you like best about the work?**

My favourite part was getting past Mr Mo. By getting a code back to class without him knowing or we get sent back.

**Q4. Do you remember why we did the spy work?**

We did the spies to try and make it help us on our writing, also it did.

**Q5. Did it help you to write?**

Yes it helped me because then I had more of an experience which then helped me with senses on how I felt.

**Q6. How did it help you to write?**

So I had more experience which helped with sentences.

**Q7. How did it help you to have lived through being a spy?**

Because we would not have known how it feels to be one, in which case it helped me with my writing.

**Questionnaires about spy work -7Hg**

**Q1. What do you remember about the spy work?**

I remember about when we had to go in the staff room and write a title of a book without the teachers catching us.

**Q2. What was it like being a spy?**

I felt very much like a spy sneaking around the school.

**Q3. What did you like best about the work?**

I liked sneaking around the school finding the codes.

**Q4.Do you remember why we did the spy work?**

To learn about spies before we wrote a story.

**Q5. Did it help you to write?**

Yes because we got to write a story that was my best writing.

**Q6. How did it help you to write?**

It helped me because I can write one again like that story because I am used to it.

**Q7. How did it help you to have lived through being a spy?**

Yes because you feel scared and frightened.

**Questionnaire about spy work -10Y**

**Q1. What do you remember about the spy work?**

I remember going around school with my friends. I had to go and crack codes.

**Q2. What was it like being a spy?**

It was a bit scary and a lot of fun.

**Q3. What did you like best about the work?**

I liked cracking the codes because I like trying to find things.

**Q4.Do you remember why we did the spy work?**

We did the spy work to help us write stories.

**Q5. Did it help you to write?**

Yes it helped me a lot.

**Q6. How did it help you to write?**

It made me write because I got excited about writing so I wrote a lot about being a spy.

**Q7. How did it help you to have lived through being a spy?**

Yes it did. It made me think a lot more so I was happy about being a spy.


**Questionnaire about spy work- 26So**

**Q1. What do you remember about the spy work?**

I remember trying to go down to the woods sneaking up on a teacher.

**Q2. What was it like being a spy?**

Being a spy is a warm feeling inside but if I was sent to war I would be worried if I was seen.

**Q3. What did you like best about the work?**

My best thing was sneaking up on a teacher.

**Q4.Do you remember why we did the spy work?**

To help us write stories about being spies.

**Q5. Did it help you to write?**

Yes because I put my emotions into it and I put things I have seen in the past from watching films.

**Q6. How did it help you to write?**

It helped me to write because I understood more about being a spy so I could make my story better.

**Q7. How did it help you to have lived through being a spy?**

It helped me more so I could feel the feeling inside and the emotions.

**Questionnaire about spy work- 18Zl**

**Q1. What do you remember about the spy work?**

I remember going through the woods looking for the secret code.

**Q2. What was it like being a spy?**

Scarily fun and interesting because it was quite scary sneaking around school and funny when I got caught.

**Q3. What did you like best about the work?**

I liked sneaking around all the ks2 building it was fun.

**Q4. Do you remember why we did the spy work?**

Yes it did so we could experience it and actually know for ourselves so we could write about it.

**Q5. Did it help you to write?**

Yes because I can actually describe what it felt like and what sort of things happened.

**Q6. How did it help you to write?**

It helped me write by knowing what it felt like and how it felt to sneak in school.

**Q7. How did it help you to have lived through being a spy?**

Yes it did because then you know what it felt like and how you did it, and how you sneaked around the school.

**Questionnaire about spy work CC2**

**Q1. What do you remember about the spy work?**

I remember going around school with a couple of people trying to crack codes. I also remember trying to get past the teacher to read the document.

**Q2. What was it like being a spy?**

It was very exciting and thrilling, especially when we had to go into the staffroom to get a book.

**Q3. What did you like best about the work?**

I really liked cracking the codes as it was really exciting trying to get from one code to another.

**Q4. Do you remember why we did the spy work?**

We did the spy work to help us with our work.

**Q5. Did it help you to write?**

It did help me to write, because I was able to put into my story my senses and my emotions.

**Q6. How did it help you to write?**

It helped me to write because I could put real life feelings into my story.

**Q7. How did it help you to have lived through being a spy?**

It did help me to be a spy more because I actually got to experience what being a spy was like which helped me to make my spy story better.

**Questionnaire about spy work 25Dt**

**Q1. What do you remember about the spy work?**

I remember that it was really good to be sneaking around school it was really scary as you could not get caught it was fun though.

**Q2. What was it like being a spy?**

Really exciting and scary as you could not get caught.

**Q3. What did you like best about the work?**

Running around the school and cracking the codes.

**Q4. Do you remember why we did the spy work?**

To help us to write our stories on Thursday and Friday.

**Q5. Did it help you to write?**

Yes it did it helped me a lot.

**Q6. How did it help you to write?**

It helped me as I could feel what it was like to be a spy.

**Q7. How did it help you to have lived through being a spy?**

Yes because you can see how people are spies.

**Questionnaire about spy work 29Hk**

**Q1. What do you remember about the spy work?**

The bit I remembered most was going around the school cracking codes because it built tension, because you can't be too loud or you'll get sent back to class.

**Q2. What was it like being a spy?**

I enjoyed it very much because if you hear footsteps you just freeze because it could be a teacher coming to tell you to go back to class.

**Q3. What did you like best about the work?**

I loved the tension of the thing because when you had to go to the woods and got a code there was a teacher hiding somewhere and you had to hide quickly.

**Q4. Do you remember why we did the spy work?**

So when we were writing we could remember the feeling of the tension.

**Q5. Did it help you to write?**

Very because you could remember your blood running cold if a teacher came and you could write about it easily.

**Q6. How did it help you to write?**

You could remember the tension in the missions.

**Q7. How did it help you to have lived through being a spy?**

It helped because you would know how they felt when they were doing their missions.

**Questionnaire about spy work JJ3**

**Q1. What do you remember about the spy work?**

Getting to places without being caught was hard. Cracking codes outside the class. Going to places we're not normally allowed.

**Q2. What was it like being a spy?**

Hard but easy in some ways. Codes were sometimes impossible to crack.

**Q3. What did you like best about the work?**

Getting out of the classroom and not doing work.

**Q4. Do you remember why we did the spy work?**

To help us with our writing. So we can imagine what it would be like so it would be easier to write.

**Q5. Did it help you to write?**

Yes very much as we knew what it was like and we could use extra words.

**Q6. How did it help you to write?**

As we had been them (spies) we knew how to write it.

**Q7. How did it help you to have lived through being a spy?**

Yes as being a spy is easier to write than just being told about them.

**Questionnaire about spy work AT10**

**Q1. What do you remember about the spy work?**

We wrote about a spy and we had to get codes before a teacher caught us it was heart pounding.

**Q2. What was it like being a spy?**

Heart pounding and very scary to sneak past teachers and windows.

**Q3. What did you like best about the work?**

Using the piece of paper to crack the codes.

**Q4. Do you remember why we did the spy work?**

To boost our imaginations and have some fun before SATs.

**Q5. Did it help you to write?**

Yes I could write what I liked about it and not have to do it straight off a sheet.

**Q6. How did it help you to write?**

You could use your imagination and not do important work you could make it what you wanted it to be.

**Q7. How did it help you to have lived through being a spy?**

It would be great just talking about spies but I would rather do the stuff going round the school. It is easier to act that you are a spy than talk about and write about a spy doing the spying. I think that it helped that we were the spies.

# Appendix 3 The structure of the brain
From www.tutorvista.com

## The structure of the brain
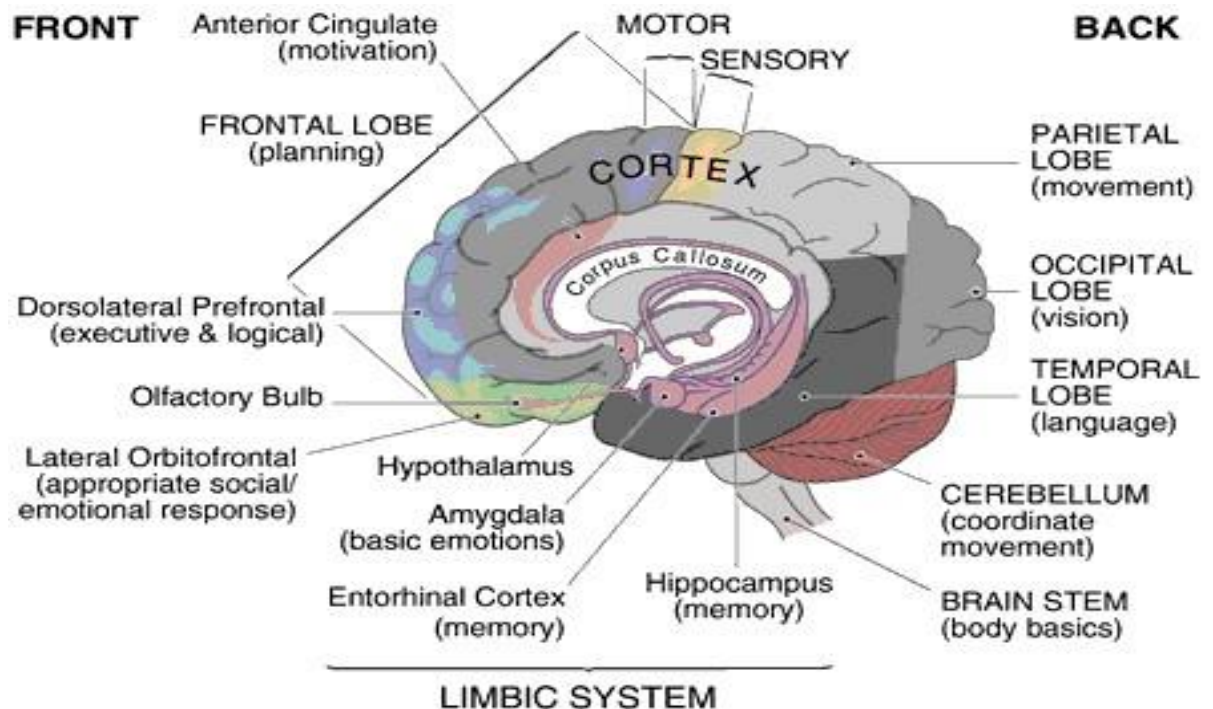


**AMYGDALA:** Lying deep in the center of the limbic emotional brain, this powerful structure, the size and shape of an almond, is constantly alert to the needs of basic survival including sex, emotional reactions such as anger and fear. Consequently it inspires aversive cues, such as sweaty palms, and has recently been associated with a range of mental conditions including depression to even autism. It is larger in male brains, often enlarged in the brains of sociopaths and it shrinks in the elderly.

**BRAIN STEM:** The part of the brain that connects to the spinal cord. The brain stem controls functions basic to the survival of all animals, such as heart rate, breathing, digesting foods, and sleeping. It is the lowest, most primitive area of the human brain.

**CEREBELLUM:** Two peach-size mounds of folded tissue located at the top of the brain stem, the cerebellum is the guru of skilled, coordinated movement (e.g., returning a tennis serve) and is involved in some learning pathways.

**CEREBRUM:** This is the largest brain structure in humans and accounts for about two-thirds of the brain's mass. It is divided into two sides — the left and right hemispheres—that are separated by a deep groove down the centre from the back of the brain to the forehead. These two halves are connected by long neuron branches called the *corpus callosum* which is relatively larger in women's brains than in men's. The cerebrum is positioned over and around most other brain structures, and its four lobes are specialized by function but are richly connected. The outer 3 millimeters of "gray matter" is the *cerebral cortex* which consists of closely packed neurons that control most of our body functions, including the mysterious state of consciousness, the senses, the body's motor skills, reasoning and language.

**The Frontal Lobe** is the most recently evolved part of the brain and the last to develop in young adulthood. Its dorsolateral prefrontal circuit is the brain's top executive. It

organizes responses to complex problems, plans steps to an objective, searches memory for relevant experience, adapts strategies to accommodate new data, and guides behaviour with verbal skills and houses working memory. Its orbito-frontal circuit manages emotional impulses in socially appropriate ways for productive behaviours including empathy, altruism, and interpretation of facial expressions. Stroke in this area typically releases foul language and fatuous behaviour patterns.

**The Temporal Lobe** controls memory storage area, emotion, hearing, and on the left side, language.

**The Parietal Lobe** receives and processes sensory information from the body including calculating location and speed of objects.

**The Occipital Lobe** processes visual data and routes it to other parts of the brain for identification and storage.

**HIPPOCAMPUS:** located deep within the brain, it processes new memories for long term storage. If you didn't have it, you couldn't live in the present, you'd be stuck in the past of old memories. It is among the first functions to falter in Alzheimer's.

**HYPOTHALAMUS:** Located at the base of the brain where signals from the brain and the body's hormonal system interact, the hypothalamus maintains the body's status quo. It monitors numerous bodily functions such as blood pressure and body temperature, as well as controlling body weight and appetite.

**THALAMUS:** Located at the top of the brain stem, the thalamus acts as a two-way relay station, sorting, processing, and directing signals from the spinal cord and mid-brain structures up to the cerebrum, an conversely, from the cerebrum down the spinal cord to the nervous system.

**Piaget's Stages**

**An Overview of Piaget's Stages of Cognitive Development**

Jean Piaget's theory of cognitive development suggests that children move through four different stages of mental development. His theory focuses not only on understanding how children acquire knowledge, but also on understanding the nature of intelligence.

| Stage | Age | Characteristics | Developmental Changes |
|---|---|---|---|
| Sensorimotor stage | Birth to 2 Years | The infant knows the world through their movements and sensations. | Infants learn that things continue to exist even though they cannot be seen (object permanence). They are separate beings from the people and objects around them. They realize that their actions can cause things to happen in the world around them. Learning occurs through assimilation and accommodation. |
| Preoperational Stage | 2 to 7 Years | Children begin to think symbolically and learn to use words and pictures to represent objects. They also tend to be very egocentric, and see things only from their point of view. | Children at this stage tend to be egocentric and struggle to see things from the perspective of others. While they are getting better with language and thinking, they still tend to think about things in very concrete terms. |
| Concrete Operational Stage | 5 to 11 | During this stage, children | They begin to understand the concept of conservation; the the |

| | Years | begin to thinking logically about concrete events. | amount of liquid in a short, wide cup is equal to that in a tall, skinny glass. Thinking becomes more logical and organized, but still very concrete. Begin using inductive logic, or reasoning from specific information to a general principle. |
|---|---|---|---|
| Formal Operational Stage | 12 and up | At this stage, the adolescent or young adult begins to think abstractly and reason about hypothetical problems. | Abstract thought emerges. Teens begin to think more about moral, philosophical, ethical, social, and political issues that require theoretical and abstract reasoning. Begin to use deductive logic, or reasoning from a general principle to specific information. |

**The spy activity:** some of the materials used in the kinaesthetic spy activity

To be cut up and placed where relevant

UXCS  IWT  UDASTG  XC  IWT  GDDB  BPGZTS-  X

ADDZ  DC  QPRZ  DU  SDDG.

XC  IWT  UDASTG  XH  IWT  CTMI  RAJT

To solve this puzzle, you need to line up A on the outside with G. The code is on the inner circle (smaller one), read the letter/number, then crack the code by reading the letter/number on the outer circle.

JXG2  9  UL  JXG2Y  TKGX  BPV.

ZTN  XH  XC  GJATG  SGPL  XC  HXM  STB.

EWDIDVGPEW  EAPCTH  DC  DIWTG  HXST  DU
VPIT.

Spy wheel- this was made from 2 card circles, one larger than the other which were attached by a split pin in the centre which allowed the circles to move past each other.
   The A for the inner code has to be set to a letter on the outer code, such as E, pupils read the code and deciphered it by converting the code to the other alphabet on the outer wheel.
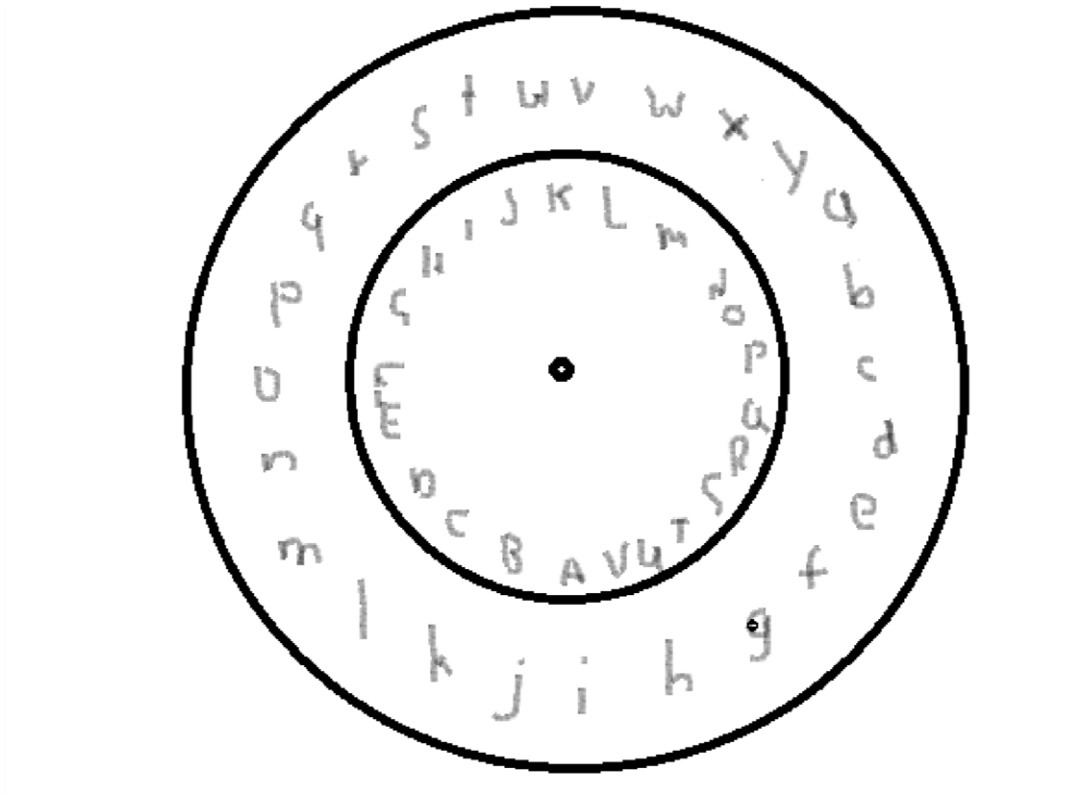
 Pupils needed to crack the codes and gain entry to a locked cupboard to photograph the plane below, (which in the activity was a secret document).

A fictitious map of a mansion used for the writing part of the spy activity. Pupils used it to plan their entry to the mansion.
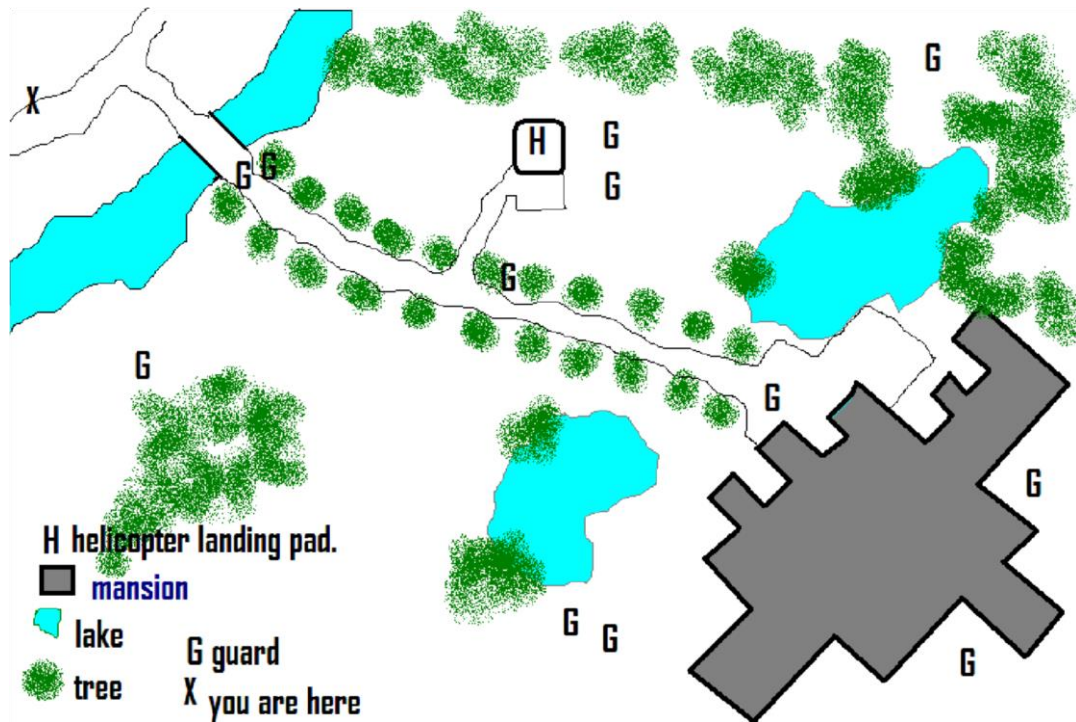
# Appendix 7- The murder mystery

Some of the resources used in the murder mystery.

## CCTV camera Report re murder.

There are three cameras covering the entrance to XXXXXX school, as well as the car park side of the school. Cameras one and two show little, nothing of any incriminating movement of persons acting suspiciously.

Camera three, to the side of the school, revealed several cars entering and leaving on the night in question. The school hall was hired out for a wedding reception; consequently, there were several hundred members of the public on the premises. Unfortunately, some of the school buildings were left open, and so access was readily available to those present.

Camera three (to the side of the school), did show a shadowy figure approach the rear of the school. Unfortunately, the camera's film failed as the figure approached.

The shape of the figure can be made out entering the car park, but the face could not be made out. Moreover, it cannot be discerned whether the figure is male or female. As a result of the figure walking towards the car park, without a car; this figure has to be at least a suspect until their identity and alibi can be established.



This is a police artists impression of the crime scene.

**Police Report about the body found in XXXXXX School**
**Compiled by Detective Inspector Ivor Grudge.**

The body was found early on Monday morning 20th January. It was lying in a pool of blood. There was a single wound to the chest area. The victim, who appears to be in her early thirties, appears to have put up quite a struggle. There was evidence of a disturbance throughout the room, with tables, chairs and books littering the floor.

The identity of the victim is unknown, there have been no reported disappearances made to the police. It is believed that she is from the Essex area. The victim was casually dressed in a yellow blouse and pair of jeans. Evidence suggests that she is from a middle class background. She was found wearing a ladies Rolex watch and she had several hundred pounds in her wallet. Robbery is not therefore suspected as a motive for the crime. As well as these items, several credit cards were found in her purse. A further reason for believing her to be middle class, is that the autopsy report stated that her hands had no calluses. She was not therefore used to hard work with her hands.

An abandoned car was found at the station end of XXXXX lane. It is not known as yet if the car is linked to the victim; consequently, it cannot help with the investigation. The car, a Lotus Elise, has been linked to the body by forensic evidence, traces of her DNA were found in the car. As a result, she must, at least have sat in the car, even if it was not hers.

The victim's hair was well cut, probably by a leading stylist. Her nails were manicured, as were her toe nails. There was evidence of extensive and expensive dental work, furthering the evidence that the victim was middle class.

There was no evidence of the building having been broken into. The front of the school is well covered by CCTV. These are currently being investigated by other officers linked to the investigation.

There are, at the moment, few real suspects. Until the identity of the woman can be found, any possible links of the crime to a husband or boyfriend can neither be pursued, nor ruled out. There are also no links that are evident to any other murders or disappearances in the East of England. Until further leads come to light, the murder of the victim, known as Miss X, will remain a mystery.

## Missing persons October-January

John Lacey- of no fixed abode. He is described as 5 feet 11 inches, has brown hair and a beard. He is 46 years old and has been homeless for some years. He used to be seen in the park, but has not been seen for 3 weeks.

Alice Hinds- 27, reported missing on Oct 19<sup>th</sup> by her parents. Worked as a kitchen assistant. Last seen wearing slacks and an anorak.

Bill Sugville- 87, Last seen on Oct 30<sup>th</sup>. Short, (under 5 feet), he lived in Westry Road.

Eric Jackson- of London, 18 years old, suspected drug dealer, his disappearance is suspicious.

Racheal Evans- last seen on the 14<sup>th</sup> November.

Janice Chawdry- 47, lived with her husband and 3 teenage children. Last seen walking towards XXXXXX train station. She worked in the chip shop in the high street.

Laura Evans- 62, lived in the expensive properties on the edge of town. Last seen by her neighbour, Mrs. Davies, leaving in her car, an Aston Martin.

Ali Corbett- 35, of West Road Flats XXXXXX town. Worked as a teaching assistant in Chapel Road school.

Patricia Jones- missing since Saturday. Last seen leaving the expensive hair salon in Eastern Road Southend. This is unusual behaviour, she has not been missing before.

Jack Harrison- Missing since yesterday (January 19<sup>th</sup>). Last seen leaving work at 5:30. He was dressed in his work overalls, which were bright yellow. He normally returned to his parents home by 6:00, but failed to arrive.

# The Daily Record

50p

## Southend lose again!

Southend United lost again for the fourth time in two weeks. The manager's job is said to be under threat. One fan of the club said ' the game against Crewe on Saturday will be the big test. If we lose that as well, the manager should go.'

More about the story on page 12 inside.

## House prices plummet !

House prices are falling at their fastest rate since the early 1990's a government spokesman said last night.

'What we need is confidence in the market' Rachael Jennings said. We are expecting the market to stabilise soon, with prices increasing in next few weeks. This will hit people in the pocket and could lead to a recession. 'A recession hits jobs, prosperity and the "feel good factor" as well' she added. We hope they rise soon.

## Maniac Escapes!

The main suspect in the disappearance of three people in the 1970's, has escaped from a secure hospital in Cornwall. Her doctor said that 'she should never have escaped, we'd never had anyone so disturbed in the hospital before. Police are actively searching for her, it is believed that she may be on her way to her mother's home in Essex.

# Appendix 8 Warhammer

The pupils designed and made their own Warhammer board, which then became the story line. Some groups marked squares onto the scenery, others moved the characters a certain agreed distance, such as 10cm.





 Hero character

 A dwarf

Some of the other characters used – both good and bad characters.

**Letter given to children asking for their permission for their data to be included in the PhD**

**Research at XXXXXX School**

**Information sheet – To the children in the class of 6DEM**

As I have told you on several occasions, I am investigating and reading about kinaesthetic teaching. I would like to see if ***a kinaesthetic approach to teaching and learning helps develop your story writing*** and find out if it motivates you to write. I aim to evaluate the difference that this approach makes to your learning.

**How will you be involved?**
- You will take part in kinaesthetic learning activities and linked writing tasks as part of the school curriculum.
- I would like to ask you to complete some questionnaires and to analyse your responses to these lessons. I would also like to look at your writing (as I always do) and ask you questions about your experience of the activities.

**Assurance of confidentiality:**
- For the purposes of the research you will be identified by a number and not by name
- In the written report, and any linked reports that I may write, neither the school nor you will be named.

**The information I would like to use:**
- Progress data held by the school (including SATs scores for literacy)
- The results of questionnaires conducted to ascertain your preferred learning style
- Your responses to questions about your learning or the activity
- Samples of your writing

If you are willing for your information to be included, please sign one of the attached consent forms. This letter and the other form are yours to keep.

**Why is the research important for education?**
There are a lot of theories about learning and learning styles, but more research is needed to understand how these may help us to find better ways of teaching children. We know from our experience at XXXXXX School that most children enjoy the practical approach to literacy and now I want to look in more detail at the links between this teaching method and your progress in your story writing.

I will be happy to discuss this proposed project in more detail and to answer any questions you may have.

Douglas Mothershaw

**An example of the kinaesthetic method adapted to maths**

**L. Objective-** to find a % fraction or decimal of a quantity.

1. **Introduction- we're going to solve problems involving %, decimals and fractions.**
2. **We looked at these areas 2-3 weeks ago, and the children found them difficult. Hopefully, the lesson today will help you to understand how to find a % fraction or decimal of a quantity.**
3. **Key words- fraction, share, mixed fraction, decimal, addition, decimal point, percentage, place value shift, halving, dividing, division and subtraction.**
4. **You will need to read through your instructions carefully. Try to answer as many questions as possible, if you have difficulties, ask for help. Look at the board- it tells you the order of restaurants to visit. So, enjoy the restaurants and enjoy your meals. *When you get to the fish and chip shop, you can ask the waitress for a drink.***

**Do the activities.-** **10 minutes at each table. Managers are free to wander around as they like (finding the % increases). You do not have to write in your book, you could work out the problems on your white boards or on a sheet of paper. It is the understanding that's important.**

**IF YOU FINISH AT A TABLE, AND CANNOT MOVE ON-**
**ANSWER THE FOLLOWING.-**
**Find 10% of- 20, 40, 45, 70, 125.**
**Find 15% of 150, 200, 140, 1010, 1240.**
**Share 6 pizzas between 4 people, 7 people, 24 people.**
**Find the total of £3.15, £4.99, 48p and £1.25.**
**How much change would you get if you paid for the meals on your table with £15 ?**

**Plenary**
**We will cover fractions, decimals and % again next term. We will revise how to find a fraction/ %/ decimal of a quantity. We will also look at the equivalents of a fraction, decimal or %. For example, we will look at the equivalent fraction and decimal of 15%.**
**ASK QUESTIONS OF EACH OF THE GROUPS.**

## Tally chart for the circles group

| Cheese pizza | Mighty meat | mushroom | chicken |
|---|---|---|---|
|  |  |  |  |

## Tasks for Pentagons

*As the managers, find the cost if the price increases by the following amounts  (round down if you need to)*

### Fish and chips

| item | 20% | 15% |
|---|---|---|
| salami |  |  |
| Fish, large |  |  |
| Fish, small |  |  |
| Fish cakes |  |  |
| Chip, large |  |  |
| Chips, small |  |  |
| coke |  |  |
| orange |  |  |

### Pizza parlour

| Pizza | 12.5% | 35% | 17.5% | 22.5% |
|---|---|---|---|---|
| chicken |  |  |  |  |
| cheese |  |  |  |  |
| Mighty meat |  |  |  |  |
| mushroom |  |  |  |  |

### Steak house

| meal | 12.5% | 22.5% | 15% |
|---|---|---|---|
| steak | | | |
| fish | | | |
| chicken | | | |
| vegetables | | | |
| chips | | | |

### Cake shop

| item | 27.5% | 7.5% |
|---|---|---|
| Jam cake | | |
| currant | | |
| tea | | |
| coffee | | |

### Tasks for Rectangles

| Pizza parlour | Fish and chip shop |
|---|---|
| Your group has £20 in total How many pizzas can you buy?<br><br>Share them out between you, what fraction does each of you have?<br><br>Calculate<br>a) 15% tip (of the total bill),<br>b) 17.5% tip. | You have £5.50. Place your order, total the cost.<br><br>How much change will you have?<br><br>Calculate the % change that you had back - (% is out of 100. there are 100 p in each £1). |

| Steak house | Cake shop |
|---|---|
| Order your choice, then total up the cost For the whole group. Share the cost equally between you- how much does each of you pay?<br><br>If you earn £200 per week, what % of your money did you spend on the meal?<br><br>What % did you spend if you earned £150 per week?<br><br>Calculate a 12.5% tip. | Place an order for a cake and a drink each. What is the cost of your groups order?<br> If you had £20 between you, what % have you spent?<br><br>If you had £ 50 between you, what % have you spent?<br><br>Buy 4 jam cakes, what fraction does each of you have?<br><br>You buy 10 cakes, what fraction does each of you have now? |

## Tasks for squares

| Pizza parlour | Fish and chip shop<br>You have £10 each |
|---|---|
| How many pizzas can you buy for £20? You must have at | |
| least one of each pizza.<br><br>Share them out between you. What Fraction does each of you have?<br><br>Calculate a 15% tip. | Choose what you'll eat.<br><br>Work out how much change you should Receive.<br><br>Calculate the % change that you get back.<br>(% is out of a hundred). |

| | |
|---|---|
| **Steak house**<br>**You have £15 each**<br><br>**Choose what you'd like to order from the menu.**<br>**Total the cost of all of your orders.**<br><br>**Share the cost equally.**<br><br>**Calculate how much a 25% tip is, of the total bill,** | **Cake shop**<br>**You have £10 for your group.**<br><br>**Order one cake each. Total the amount that**<br>**The group must pay.**<br><br>**Calculate the change that you should receive.**<br><br>**Share the cakes out- what fraction does each of you Receive?** |

**Task for Triangles**

| | |
|---|---|
| **Steak house**<br><br>**You have £15 each.**<br>**How much does**<br>**your meal cost?**<br><br>**How much change**<br>**do you get?**<br><br>**Leave a 20% tip.** | **Cake shop**<br><br>**Place your order.**<br>**You have £10 for**<br>**the group.**<br><br>**Find the cost of**<br>**your cakes.**<br><br>**Share them out.**<br>**What fraction**<br>**does each of You**<br>**have?** |

# Appendix 11   OECD country ranking in PISA tests

**Source** https://www.theguardian.com/news/datablog/2013/dec/03/pisa-results-country-best-reading-maths-science

## PISA results: performance in mathematics

| | COMPARISON COUNTRY / | MEAN SCORE ECONOMY |
|---|---|---|
| 1 | Shanghai-China | 613 |
| 2 | Singapore | 573 |
| 3 | Hong Kong-China | 561 |
| 4 | Chinese Taipei | 560 |
| 5 | Korea | 554 |
| 6 | Macao-China | 538 |
| 7 | Japan | 536 |
| 8 | Liechtenstein | 535 |
| 9 | Switzerland | 531 |
| 10 | Netherlands | 523 |
| 11 | Estonia | 521 |
| 12 | Finland | 519 |
| 13 | Canada | 518 |
| 14 | Poland | 518 |
| 15 | Belgium | 515 |
| 16 | Germany | 514 |
| 17 | Vietnam | 511 |
| 18 | Austria | 506 |
| 19 | Australia | 504 |
| 20 | Ireland | 501 |
| 21 | Slovenia | 501 |
| 22 | Denmark | 500 |
| 23 | New Zealand | 500 |
| 24 | Czech Republic | 499 |
| 25 | France | 495 |
| 26 | United Kingdom | 494 |
| 27 | Iceland | 493 |
| 28 | Latvia | 491 |
| 29 | Luxembourg | 490 |
| 30 | Norway | 489 |
| 31 | Portugal | 487 |
| 32 | Italy | 485 |
| 33 | Spain | 484 |
| 34 | Russian Federation | 482 |
| 35 | Slovak Republic | 482 |
| 36 | United States | 481 |
| 37 | Lithuania | 479 |
| 38 | Sweden | 478 |
| 39 | Hungary | 477 |
| 40 | Croatia | 471 |

| 41 | Israel | 466 |
|---|---|---|
| 42 | Greece | 453 |
| 43 | Serbia | 449 |
| 44 | Turkey | 448 |
| 45 | Romania | 445 |

## PISA results: performance in reading

| POSITION | COMPARISON COUNTRY / ECONOMY | MEAN SCORE |
|---|---|---|
| 1 | Shanghai-China | 570 |
| 2 | Hong Kong-China | 545 |
| 3 | Singapore | 542 |
| 4 | Japan | 538 |
| 5 | Korea | 536 |
| 6 | Finland | 524 |
| 7 | Ireland | 523 |
| 8 | Chinese Taipei | 523 |
| 9 | Canada | 523 |
| 10 | Poland | 518 |
| 11 | Estonia | 516 |
| 12 | Liechtenstein | 516 |
| 13 | New Zealand | 512 |
| 14 | Australia | 512 |
| 15 | Netherlands | 511 |
| 16 | Belgium | 509 |
| 17 | Switzerland | 509 |
| 18 | Macao-China | 509 |
| 19 | Vietnam | 508 |
| 20 | Germany | 508 |
| 21 | France | 505 |
| 22 | Norway | 504 |
| 23 | United Kingdom | 499 |
| 24 | United States | 498 |
| 25 | Denmark | 496 |
| 26 | Czech Republic | 493 |
| 27 | Italy | 490 |
| 28 | Austria | 490 |
| 29 | Latvia | 489 |
| 30 | Hungary | 488 |

## PISA results: performance in science

| POSITION | COMPARISON COUNTRY / ECONOMY | MEAN SCORE |
|---|---|---|
| 1 | Shanghai-China | 580 |
| 2 | Hong Kong-China | 555 |
| 3 | Singapore | 551 |
| 4 | Japan | 547 |
| 5 | Finland | 545 |

| POSITION | COMPARISON COUNTRY / ECONOMY | MEAN SCORE | |
|---|---|---|---|
| 6 | Estonia | 541 | |
| 7 | Korea | 538 | |
| 8 | Vietnam | 528 | |
| 9 | Poland | 526 | |
| 10 | Canada | 525 | |
| 11 | Liechtenstein | 525 | |
| 12 | Germany | 524 | |
| 13 | Chinese Taipei | 523 | |
| 14 | Netherlands | 522 | |
| 15 | Ireland | 522 | |
| 16 | Australia | 521 | |
| 17 | Macao-China | 521 | |
| 18 | New Zealand | 516 | |
| 19 | Switzerland | 515 | |
| 20 | Slovenia | 514 | |
| 21 | United Kingdom | 514 | |
| 22 | Czech Republic | 508 | |
| 23 | Austria | 506 | |
| 24 | Belgium | 505 | |
| 25 | Latvia | 502 | |
| 26 | France | 499 | |
| 27 | Denmark | 498 | |
| 28 | United States | 497 | |
| 29 | Spain | 496 | |
| 30 | Lithuania | 496 | |

**Appendix 12**

**Survey of pupil attitude to learning**

Is learning fun?

    No, I find it hard.

    I enjoy it sometimes but not all the time.

    I like learning some subjects.

    I love learning in almost all subjects, especially if it's something new.

How would you deal with a problem with your work?

    Ask the teacher or LSA.

    Ask a friend to explain.

    Try to do it again myself.

    Go through the problem in steps and try to identify the problem.

What type of work do you like best?

    Practise work, work that I understand.

    Work that is either a little bit different or hard.

    Work that is challenging.

    Work that requires me to use knowledge of several subjects.

How often do you think that work should be challenging or difficult?

    Never.

    Sometimes.

    Once a week.

    Several times a week or once a day.

Have you enjoyed any challenging tasks this year, and if so which challenging tasks have you enjoyed? (for example, finding a percentage of a quantity, algebra, understanding the difference between formal/ informal writing).

None.

Only a few.

Most, but not all.

All of them, I'd like more challenging work.

Give an example if you can –


Is your intelligence fixed or can it be increased?

Fixed, I won't get any cleverer.

Mostly, it can't be changed much.

It can be changed sometimes.

It can always be changed.

What makes you want to learn?

I don't want to learn, I don't like school.

My parents want me to do well, and for me to be clever.

I want to get better in some subjects.

I love learning new things.

Give an example if you can-


If you don't understand something you've been taught, why do you think this is?

I'm not clever.

I'm not good at some subjects.

It's because the teacher didn't explain it well, or I didn't listen.

I need to try to solve the problem in a different way.

# Appendix 13

## A more in-depth explanation of levels.

### Each National Curriculum level was divided into sub-levels:

- C means that a child is working at the lower end of the level
  - B means that he's working comfortably at that level
  - A means that he's working at the top end of the level

As a guide, here's what national curriculum level the Government suggested a child should achieve by the end of each school year:

| | |
|---|---|
| Year 1 | Level 1b |
| Year 2 | Level 2a-c |
| Year 3 | Level 2a-3b |
| Year 4 | Level 3 |
| Year 5 | Level 3b-4c |
| Year 6 | Level 4 |

**By the end of Year 6, approximately 75 per cent of children were expected to achieve a Level 4; the top 10 per cent will achieve a Level 5, and the 'exceptional' top one per cent, a Level 6.** Children who achieve a Level 4 are expected to go on to pass five or more GCSEs at grade A*-C.

When a child did the KS2 SATs, initially, (s)he would only be given an overall level (for example a Level 4); a sub-level (for example, 4b) were then allocated later on, once the results had been reviewed nationally, and thresholds set.

**Appendix 14**

**Examples of parental consent**

**Research at XXXXXX School**

**Information sheet – To the parents / guardians of pupils in 6DEM**

As part of my continuing professional development as a teacher, I am undertaking research, at PhD level, at Anglia Ruskin University. I am interested in researching an aspect of my own teaching and would like to analyse, in greater detail, data about children's progress in literacy. As your child is a current member of my class I am interested in discovering more about his / her learning. This information sheet outlines my research.

I intend to investigate *the impact of a kinaesthetic approach to teaching and learning approach on children's story writing* and explore how this affects their motivation to write. As you may know, at XXXXXX School we have been using a variety of role play and active learning methods to encourage children to develop their writing skills. I aim to evaluate the difference that this approach makes to their learning.

### How will the children be involved?

- All the children will take part in kinaesthetic learning activities and the linked writing tasks as part of the school curriculum.
- I would like to analyse their responses to these lessons by looking at their writing and asking them questions about their experience of the activities.
- When planning work, the kinaesthetic approach will be used, for example, the shopping activity, and meal preparation for report writing, carried out in October. In January, the children will role play being a spy in the writing module about spies. They will be required to crack codes and to avoid being seen by guards whilst carrying out their missions.

### Assurance of non-disclosure of information to third parties:

- For the purposes of the research each child will be identified by a number and not by name
- In the written report, and any linked professional publication, neither the school nor any child will be named.

**The information I would like to use:**

- Progress data held by the school (including SATs scores for literacy)
- The results of questionnaires conducted to ascertain your child's preferred learning style by the class teacher
- Children's responses to questions about their learning
- Samples of children's writing

If you are willing for your child's information to be included, please sign one of the attached permission forms and return it to the school. This letter and the other form are yours to keep.

**Why is the research important for education?**

There are many theories about learning and learning styles but more research is needed to understand how these may translate into the most effective ways of teaching children.

We know from our experience at XXXXXX School that children enjoy the practical approach to literacy and now we want to look systematically at the links between this teaching method and children's progress in their story writing.

I will be happy to discuss this proposed project and answer any questions you may have.

Douglas Mothershaw

I give my permission for my daughters results to be included and for you to complete any other tests as stated.

J. Hall

**Information sheet – To the parents / guardians of pupils in 6DEM**

As part of my continuing professional development as a teacher, I am undertaking research, at PhD level, at Anglia Ruskin University. I am interested in researching an aspect of my own teaching and would like to analyse, in greater detail, data about children's progress in literacy. As your child is a current member of my class I am interested in discovering more about his / her learning. This information sheet outlines my research.

I intend to investigate *the impact of a kinaesthetic approach to teaching and learning approach on children's story writing* and explore how this affects their motivation to write. As you may know, at XXXXXX School we have been using a variety of role play and active learning methods to encourage children to develop their writing skills. I aim to evaluate the difference that this approach makes to their learning.

### How will the children be involved?

- All the children will take part in kinaesthetic learning activities and the linked writing tasks as part of the school curriculum.
- I would like to analyse their responses to these lessons by looking at their writing and asking them questions about their experience of the activities.
- When planning work, the kinaesthetic approach will be used, for example, the shopping activity, and meal preparation for report writing, carried out in October. In January, the children will role play being a spy in the writing module about spies. They will be required to crack codes and to avoid being seen by guards whilst carrying out their missions.

### Assurance of non-disclosure of information to third parties:

- For the purposes of the research each child will be identified by a number and not by name
- In the written report, and any linked professional publication, neither the school nor any child will be named.

### The information I would like to use:

- Progress data held by the school (including SATs scores for literacy)

- The results of questionnaires conducted to ascertain your child's preferred learning style by the class teacher
- Children's responses to questions about their learning
- Samples of children's writing

If you are willing for your child's information to be included, please sign one of the attached permission forms and return it to the school. This letter and the other form are yours to keep.

**Why is the research important for education?**

There are many theories about learning and learning styles but more research is needed to understand how these may translate into the most effective ways of teaching children.

We know from our experience at XXXXXX School that children enjoy the practical approach to literacy and now we want to look systematically at the links between this teaching method and children's progress in their story writing.

I will be happy to discuss this proposed project and answer any questions you may have.

Douglas Mothershaw

*Julie Moore*

# Appendix 15

## Interviews with the children

**Interview with WM1:**

Q1. Have you enjoyed any of the work this year?

- WM1: Yes, I really liked the spy stuff and the murder mystery, and I liked the art. I didn't like maths and science is boring.

Q2 Did you enjoy some work more than others?

- WM1: Definitely the spy week that was the best.
- Me: Did you enjoy any other work?
- WM1: I liked art, and maths...
- Me: anything else?
- WM1: I liked the murder mystery, that was almost as good as the spy work and the Warhammer game that we did at the start of the year.
- Me: OK thanks (name used).

Q3 How do you like to learn best?

- WM1: I liked the spy stuff best.
- Me: sorry, let me put it another way, do you like to sit in class listening, or do you learn better by doing thing yourself?
- WM: I like doing it best.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- WM1: Yes- especially when I was being a spy, and the guards were there, that was the best.
- Me: Was that the only time you felt like an expert?
- WM1: No, and with the murder, and the game we made at the start of the year and my art got better.

Q5 Did anything this year help your writing to improve?

- WM1: Yes, doing things myself.
- Me: can you explain that, can you explain what you mean?
- WM: I found it easier to write after I'd acted it because I could remember what I'd done so I knew what to write next.
- Me: So it helped you with the writer's block?
- WM1: I don't know what that means.
- Me: That's where you find it difficult to write, and you can't think of what to write next. Did you find it easier to write after you'd acted out one of the roles?
- WM1: Yes. I remembered what I'd done, so I knew what came next.

Q6, How did carrying out the activities, help you to write do you think?

- WM1: I don't know.
- Me: did any of the things we did help you to remember or anything else?
- WM1: Yes, it helped me to remember and helped me to think.
- Me: So could you find a word to explain that further?
- WM1: It helped me to imagine, and it made it real like I was really there.
- Me: very good, thanks.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- WM1: ....er
- Me: Do you not understand?
- WM1: No
- Me: When you were acting out a role, did you feel excited, nervous, or scared at any stage?
- WM1: When I had to get past the spies, I got really scared, and they weren'tbeing fair, they came after us and you said they weren't supposed to, and Alex got me...
- Me: So could you explain further how being a spy actually helped you to write your story?
- WM1: No... I don't get you.

- Me: what I mean is, how did it help you to imagine you were there as you said before?
- WM1: I got all tingly, and my hands got sweaty, so when I came to write, I could include all of that, and I knew what to write instead of having to think.

**Interview with ON7**

Q1. Have you enjoyed any of the work this year?

- ON7: Yes some of it, but not maths, I don't like maths.
- Me: Do you remember that I am doing special work this year?
- ON7: No what is it?
- Me: I am doing research, so I wanted to know about how you found the work in English, when we do story writing.
- ON7: You mean like the Warhammer game?
- Me: Yes, and the spy work and murder mystery, did you enjoy that work?
- ON7: Oh yeah, that's been the best work so far in school, I didn't like the Warhammer as much as the other work though.
- Me: thanks, I think you've answered my next question as well, so I'll move on.

Q2 Did you enjoy some work more than others?

- Me: As you just said, you liked some of the work more than others, I take it that you enjoyed both the spy work and the murder mystery work.
- ON7: yes, both were really good.

Q3 How do you like to learn best?

- ON7: when I'm interested and I like the teacher.
- Me: do you think that you learn best by doing something or by watching or listening?
- ON7: doing is the most fun, sometimes, teachers talk too much and go on.
- Me: Ok, thanks.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- ON7: Yeah sometimes, I forgot what I was doing when we were being the spies that's why I got excited and got told off by the teachers for running.
- Me: some of you did get a bit excited didn't you? Did you feel like a real spy though?
- ON7: I did, especially when there were the guards out and we had to run away from them and not get caught. I felt like it was really important, but I also thought it was a game.
- Me: Did any other work make you feel like an expert?
- ON7: The murder mystery felt real especially when you made me a detective and we were searching for clues to the killer, I really wanted to find some clues, but I didn't, it was Alex who found the knife and some of the girls found the blood.
- Me: did you feel like an expert in the Warhammer game?
- ON7: No but I liked it, but not as much as the other work.

Q5 Did anything this year help your writing to improve?

- ON7: Yes, all the work for SATs and the grammar stuff and story writing.
- Me: So a little of everything helped you to improve your writing?
- ON7: Yes.
- Me: If you had to pick out one thing, what would that be?
- ON7: The SATs stuff.
- Me: not the work we did for story writing, like the murder mystery work?
- ON7: Oh yeah that as well… I thought you meant the other work.
- Me: Ok thanks.

Q6, How did carrying out the activities, help you to write do you think?

- ….Thinking
- ON7: When I did the spy stuff, I could remember how I felt, I got really nervous. The Warhammer helped me with the story, cause I could remember the board…
- Me: That was a good answer, and how about the murder mystery?

- ON7: That helped as well.
- Me: How?
- ON7: I can't think.
- Me: OK, thanks, we'll move on, that was a useful answer.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- ON7: Do you mean with the murder mystery again?
- Me: No I mean with any of the activities.
- ON7: When you gave us the map of the mansion for the story line in the spy work, I could follow the map and add in the excitement and how I felt from being a spy.
- Me: that makes sense, thanks, do you want to get back to your work now?
- ON7: Yes please.

**Interview with 12J.**

Q1. Have you enjoyed any of the work this year?

- 12J: Yes, everything.
- Me: Everything?
- 12J: Yes- all of it.
- Me: Maths, English, PE, Music, Art, Science?
- 12J: Yes all of those.
- Me: Well, did you enjoy anything in particular?
- 12J: Yes, PGL (adventure holiday) and Art.
- Me: Is that all?
- 12J: yes and the spy work and the murder mystery work.
- Me: OK, thanks.

Q2 Did you enjoy some work more than others?

- 12J: Art is my favourite.

- Me: Was nothing as good as Art?
- 12J: not really.
- Me: OK, did you enjoy English and in particular story writing?
- 12J: Oh yes, I loved it.
- Me: OK, I don't want to lead you too much, thanks, you have answered the question.
- 

Q3 How do you like to learn best?

- 12J: BY listening to the teacher and then doing my work.
- Me: OK thanks, I'll move on.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- 12J: As in the spy work?
- Me: Yes.
- 12J: Yes I did feel like I was really a spy, but I didn't get as excited as some of the others.
- Me: How should you act if you're a spy?
- 12J: Quietly and not be seen.
- Me: Good. Did you act like that?
- 12J: Yes, I made sure I wasn't caught so I went around really quietly and I was careful.

Q5 Did anything this year help your writing to improve?

- 12J: Everything
- Me: Anything in particular?
- 12J: I suppose you mean the spies and murder… they helped, because I could remember how I felt when I was writing, so I didn't get stuck.

Q6, How did carrying out the activities, help you to write do you think?

- 12J: It helped me to include my emotions, cause you said I should include my

emotions and the thoughts of my character. It also helped me put bigger words in, like surreptitious clandestine and insidious.

- Me: That was a really good answer, not that there's any right or wrong ones.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- 12J: Like I just said- about the words and emotions, it helped me to write because I'd done the work.
- Me: thanks.

**Interviews in 2011**

**Interview with 25Ca**

Q1. Have you enjoyed any of the work this year?

- 25Ca: Yes, especially the science and I loved the murder mystery and the spy work.
- Me: You didn't enjoy the Warhammer as much?
- 25Ca: What was that?
- Me: The work right at the start in September, when we made the games and the figures and they moved around the board and they fought Orcs and Gremlins.
- 25Ca: Oh yes, that was good… I'd forgotten about that.

Q2 Did you enjoy some work more than others?

- 25Ca: Yes, maths and art.
- Me: and English?
- 25Ca: not the reading.
- Me: But you enjoyed other things that we did?
- 25Ca: I liked the stuff I just said.
- Me: What was that?
- 25Ca: the spies and the murder mystery.

Q3 How do you like to learn best?

- 25Ca: In art and maths.
- Me: Sorry, I meant, how do you learn in general, by listening, doing or by watching someone do it?
- 25Ca: By doing it
- Me: Thanks.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- 25Ca: When was I an expert?
- Me: When we did the spy work, the Warhammer and the murder mystery work.
- 25Ca: Was I an expert?
- Me: Well, I hoped you'd see it that way. Are you saying you didn't feel like an expert?
- 25Ca: Yes.
- Me: OK, we'll move on, sorry about that, I had hoped you would.

Q5 Did anything this year help your writing to improve?

- 25Ca: Yes.
- Me: What? What do you think helped to improve, let's say- your story writing?
- 25Ca: The work we did.
- Me: which work, can you give me an example? I don't want to put ideas into your head, I want it to be really what you think.
- 25Ca: The best story I did was the one about the murder mystery I think.
- Me: what was good about that? I'm not saying it wasn't, if I remember it was really good, but what made you think it was good?
- 25Ca: I used all the evidence, and I included it all in my story, so it had lots of detail in it and it was like a real murder story, first you thought it was one person, than the other.
- Me: Good answer, thanks.

Q6, How did carrying out the activities, help you to write do you think?

- 25Ca: I included all the detail and I even put the search in for the murder

weapon, because we'd been outside and done it.

- Me: Can you be specific about the detail?
- 25Ca: What do you mean?
- Me: I mean, can you give an example of any words or things about the characters that you included because we'd acted parts of the murder mystery out?
- 25Ca: You mean like the jeans we found on the fence- where they'd been caught by the murderer and we found them?
- Me: Yes that's a good example.
- 25Ca: I wrote about him having jeans cause we found part of them torn on the fence and we found some blood… you know, not real blood, but the red paint that was on the grass.
- Me: Thank you, you answered that well.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- 25Ca: The one I just gave- the one about the paint and the jeans.
- Me: Alright, thanks
- 25Ca: Can I go now?
- Me: Yes, thank you.

**Interview with 2To**

Q1. Have you enjoyed any of the work this year?

- 2To: All of the English work, I love reading and writing, so it's all; been fun.
- Me: which work in particular?
- 2To: Stories in particular, spies, the murder mystery and some of the real work in maths.
- Me: what do you mean by real work?
- 2To: The kinaesthetic work, the restaurant, where we did about the fractions and percentages, I was a manageress, that was good work, some of the best we've ever done.

Q2 Did you enjoy some work more than others?

- Me: I think that you just answered this question.
- 2To: Yes

Q3 How do you like to learn best?

- 2To: I make sure I listen well, but if I don't understand then I ask a friend, they help really well.
- Me: Do you learn best by listening to a teacher, by watching a video or something or by doing the work and experiencing it?
- 2To: Probably by doing it, by acting it out, because I include some better words and I can put how I thought in.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- 2To: Sometimes, such as when I was avoiding the guards (in the spy activity) and when I was searching for clues as a detective (murder mystery activity).

Q5 Did anything this year help your writing to improve?

- 2To: I think that experiencing something before writing helped me.
- Me: How?
- 2To: Being a spy, avoiding the guards, finding the key to the storeroom all made it exciting, I'm sure that's what it must be like to be a spy. I think I want to be a spy when I grow up.

Q6, How did carrying out the activities, help you to write do you think?

- 2To: I think that being a spy or a detective helped me to understand what it was like, so when I was writing, I could include what it was like.
- Me: Can you expand?
- 2To: What does that mean?
- Me: Can you give me an example of how you included what it was like?
- 2To: I think I wrote some in my book. Shall I get it?
- Me: Yes if you can't remember, it was some time ago.

- 2To: (reading) This is one example. A tingle ran down my spine as I crept across the mansion lawn. Hidden by the shroud of darkness. I gulped, sweaty palms clenched my gun. A noise! I dropped. I stared wide-eyed. There, just feet away was a guard. I readied my gun.
- Me: That's a good example, you wrote that from your imagination having acted the role of a spy?
- 2To: Yes.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- 2To: That's a bit like the last one.
- Me: Yes, I suppose it is. I designed these questions to help people who might not be able to answer the questions that easily. Thanks.

**Interview with 28Aa (very quiet child)**

Q1. Have you enjoyed any of the work this year?

- 28Aa: Yes.
- Me: anything in particular?
- 28Aa yes.
- Me: Can you give me an example?
- 28Aa: The game we did and the spies.
- Me: Thanks.

Q2 Did you enjoy some work more than others?

- 28Aa: the spies.
- Me: Was that the best work you did?
- 28Aa: Yes.
- Me: can you explain why?
- 28Aa: it was good, I liked it…

- Me: Why, can you explain?

- 28Aa: It was good, fun.

- Me: Thanks, let's move on to the next question.


Q3 How do you like to learn best?

- 28Aa: don't know

- Me: Do you learn best by listening, watching or by doing?

- 28Aa Doing.


Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- 28Aa: Yes.

- Me: Can you explain how or why?

- 28Aa: No.

- Me: You just enjoyed it?

- 28Aa: Yes.


Q5 Did anything this year help your writing to improve?

- 28Aa Not sure.

- Me: what I meant was, did the work such as the spies help you to experience being a spy, so that when you came to write a story about spies, you could bring in emotions and feelings?

- 28Aa: Yes.

- Me: OK, thanks I think I was leading you there… anyway, lets carry on. Do you mind carrying on?

- 28Aa: No.


Q6, How did carrying out the activities, help you to write do you think?

- 28Aa: don't know.

- Me: By acting the part of a detective, were you able to call upon your experiences when it came to writing the story about it?

- 28Aa: Yes.
- Me: OK thanks, almost finished, thanks again for doing this.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- Me: Last question now.
- 28Aa…(thinking) I could put in how I felt when I was writing about the spies.
- Me: Great, thanks for that, that's the last question.

**Interview with 9Jf**

Q1. Have you enjoyed any of the work this year?

- 9Jf: Yes, the spy work, the murder mystery and the restaurant work we did in maths, when we did the percentages and fraction.

Q2 Did you enjoy some work more than others?

- 9Jf: The spies was the best, then the restaurant in maths, then the murder mystery.
- Me: and the Warhammer game?
- 9Jf: Yes, I'd forgotten that one, that was good, but not as good as the others, I enjoyed it when we did it though, it was better than anything we did in year five.

Q3 How do you like to learn best?

- 9Jf: I learn best by listening to the teacher, but I like the kinaesthetic work the best.
- Me: You even remembered the term.
- 9Jf: Yes, you do go on about it a bit.
- Me: Thanks, good answer, let's move on to the next question.

Q4 How did you feel when you were acting out the role of an expert, did it feel as though you were in a real situation?

- 9Jf: I'm not sure that I felt like an expert, but I felt like I was really there. I did get really excited about the work, we all did, we all loved it.

- Me: I think that you answered that quite fully, thanks.

Q5 Did anything this year help your writing to improve?

- 9Jf: I guess by that you mean the kinaesthetic work? Yes, it did, because I thought of the words I wanted to use instead of just putting words down for the sake of it. I also found it easier to write because I just had to think about what happened, then I wrote it down.
- Me: Good answer again, not that there's any right or wrong.

Q6, How did carrying out the activities, help you to write do you think?

- 9Jf: Like I just said- I wrote about what happened and I could include how I felt.
- Me: Yes you did answer it I think.

Q7 Could you give an example of how you were helped to write by carrying out the practical work when we were doing story writing?

- 9Jf: Like with the murder one, I remember being excited about searching for the clues to the murderer, I wanted to be the one that found it. It was exciting, I could put down tingly feelings and the excitement.
- Me: Ok, thanks, that's the last question, you gave some really good answers.

### The VARK questionnaire

The VARK questionnaire can be found at:

http://www.vark-learn.com/english/page.asp?p=questionnaire This was read to the pupils and some of the questions were modified or explained to make them more relevant to their age group for example, the third question (about the tourists) was explained as visitors to the school.

The VARK Questionnaire

**How Do I Learn Best?**

Questionnaire version 7.1

Choose the answer which best explains your preference and cross the box next to it. **Please cross more than one** if a single answer does not match your perception. Leave blank any question that does not apply.

**A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:**

watching the actions.
reading the words.   **X**
listening.
seeing the diagrams.

**You have finished a competition or test and would like some feedback. You would like to have feedback:**

using graphs showing what you had achieved.
using examples from what you have done.
using a written description of your results.  **X**
from somebody who talks it through with you.

**A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:**

take them to a park or wildlife reserve and walk with them.
give them a book or pamphlets about the parks or wildlife reserves.   **X**
show them maps and internet pictures.
talk about, or arrange a talk for them about parks or wildlife reserves.

**You have a problem with your heart. You would prefer that the doctor:**

used a plastic model to show what was wrong.
described what was wrong.
gave you something to read to explain what was wrong.  **X**
showed you a diagram of what was wrong.

**You are planning a vacation for a group. You want some feedback from them about the plan. You would:**

give them a copy of the printed itinerary.
phone, text or email them.
describe some of the highlights they will experience.
use a map to show them the places.     **X**

**Remember a time when you learned how to do something new. Avoid choosing a physical skill, eg. riding a bike. You learned best by:**

watching a demonstration.
diagrams, maps, and charts - visual clues.
listening to somebody explaining it and asking questions.
written instructions – e.g. a manual or book.   **X**

**You are helping someone who wants to go to your airport, the centre of town or railway station. You would:**

go with her.    X
tell her the directions.
write down the directions.    **X**
draw, or show her a map, or give her a map.

**Do you prefer a teacher or a presenter who uses:**

question and answer, talk, group discussion, or guest speakers.    **X**
demonstrations, models or practical sessions.
diagrams, charts or graphs.
handouts, books, or readings.

**You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:**

clear written instructions with lists and bullet points about what to do.   **X**
many examples of good and poor photos and how to improve them.
a chance to ask questions and talk about the camera and its features.
diagrams showing the camera and what each part does.

**I like websites that have:**

things I can click on, shift or try.
audio channels where I can hear music, radio programs or interviews.   **X**
interesting written descriptions, lists and explanations.
interesting design and visual features.

**You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?**

The salesperson telling me about its features.
Trying or testing it
Reading the details or checking its features online.   **X**
It is a modern design and looks good.

**You have to make an important speech at a conference or special occasion. You would:**

gather many examples and stories to make the talk real and practical.
write a few key words and practice saying your speech over and over.
write out your speech and learn from reading it over several times.   **X**
make diagrams or get graphs to help explain things.

**You are going to choose food at a restaurant or cafe. You would:**

look at what others are eating or look at pictures of each dish.
choose something that you have had there before.
listen to the waiter or ask friends to recommend choices.   **X**
choose from the descriptions in the menu.

**You are going to cook something as a special treat. You would:**

cook something you know without the need for instructions.
use a good recipe.
ask friends for suggestions.
look on the Internet or in some cookbooks for ideas from the pictures.   **X**

**You want to learn a new program, skill or game on a computer. You would:**

use the controls or keyboard.
talk with people who know about the program.
read the written instructions that came with the program.   **X**
follow the diagrams in the book that came with it.

**Other than price, what would most influence your decision to buy a new non-fiction book?**

A friend talks about it and recommends it.
Quickly reading parts of it.    **X**
It has real-life stories, experiences and examples.
The way it looks is appealing

### 9JF September 2010

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**A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:**

watching the actions.   **X**
reading the words.
listening.
seeing the diagrams.


**You have finished a competition or test and would like some feedback. You would like to have feedback:**

using graphs showing what you had achieved.   **X**
using examples from what you have done.
using a written description of your results.
from somebody who talks it through with you.


**A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:**

take them to a park or wildlife reserve and walk with them.
give them a book or pamphlets about the parks or wildlife reserves.   **X**
show them maps and internet pictures.
talk about, or arrange a talk for them about parks or wildlife reserves.


**You have a problem with your heart. You would prefer that the doctor:**

used a plastic model to show what was wrong.
described what was wrong.
gave you something to read to explain what was wrong.
showed you a diagram of what was wrong.   **X**


**You are planning a vacation for a group. You want some feedback from them about the plan. You would:**

give them a copy of the printed itinerary.
phone, text or email them.
describe some of the highlights they will experience.
use a map to show them the places.   **X**


**Remember a time when you learned how to do something new. Avoid choosing a physical skill, eg. riding a bike. You learned best by:**

watching a demonstration.   **X**
diagrams, maps, and charts - visual clues.
listening to somebody explaining it and asking questions. written instructions – e.g. a manual or book.


**You are helping someone who wants to go to your airport, the centre of town or railway station. You would:**

go with her.
tell her the directions.
write down the directions.
draw, or show her a map, or give her a map.   **X**


**Do you prefer a teacher or a presenter who uses:**

question and answer, talk, group discussion, or guest speakers.
demonstrations, models or practical sessions.   **X**
diagrams, charts or graphs.
handouts, books, or readings.


**You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:**

clear written instructions with lists and bullet points about what to do.
many examples of good and poor photos and how to improve them.
a chance to ask questions and talk about the camera and its features.
diagrams showing the camera and what each part does.   **X**

**I like websites that have:**

things I can click on, shift or try.
audio channels where I can hear music, radio programs or interviews.
interesting written descriptions, lists and explanations.
interesting design and visual features.   **X**


**You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?**

The salesperson telling me about its features.
Trying or testing it
Reading the details or checking its features online.
It is a modern design and looks good.   **X**


**You have to make an important speech at a conference or special occasion. You would:**

gather many examples and stories to make the talk real and practical.
write a few key words and practice saying your speech over and over.
write out your speech and learn from reading it over several times.
make diagrams or get graphs to help explain things.   **X**


**You are going to choose food at a restaurant or cafe. You would:**

look at what others are eating or look at pictures of each dish.   **X**
choose something that you have had there before.
listen to the waiter or ask friends to recommend choices.
choose from the descriptions in the menu.


**You are going to cook something as a special treat. You would:**

cook something you know without the need for instructions.
use a good recipe.

ask friends for suggestions.
look on the Internet or in some cookbooks for ideas from the pictures.   **X**

**You want to learn a new program, skill or game on a computer. You would:**

use the controls or keyboard.
talk with people who know about the program.
read the written instructions that came with the program.   **X**
follow the diagrams in the book that came with it.

**Other than price, what would most influence your decision to buy a new non-fiction book?**

A friend talks about it and recommends it.   **X**
Quickly reading parts of it.
It has real-life stories, experiences and examples.
The way it looks is appealing

**23JW July 2010**

**The VARK questionnaire**

The VARK questionnaire can be found at:

http://www.vark-learn.com/english/page.asp?p=questionnaire This was read to the pupils and some of the questions were modified or explained to make them more relevant to their age group for example, the third question (about the tourists) was explained as visitors to the school.

The VARK Questionnaire

**How Do I Learn Best?**

Questionnaire version 7.1

Choose the answer which best explains your preference and cross the box next to it. **Please cross more than one** if a single answer does not match your perception. Leave blank any question that does not apply.

**A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:**

watching the actions.
reading the words.
listening.   **X**
seeing the diagrams.

**You have finished a competition or test and would like some feedback. You would like to have feedback:**

using graphs showing what you had achieved.   **X**
using examples from what you have done.

using a written description of your results.
from somebody who talks it through with you.

**A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:**

take them to a park or wildlife reserve and walk with them.   **X**
give them a book or pamphlets about the parks or wildlife reserves.
show them maps and internet pictures.
talk about, or arrange a talk for them about parks or wildlife reserves.

**You have a problem with your heart. You would prefer that the doctor:**

used a plastic model to show what was wrong.
described what was wrong.
gave you something to read to explain what was wrong.   **X**
showed you a diagram of what was wrong.

**You are planning a vacation for a group. You want some feedback from them about the plan. You would:**

give them a copy of the printed itinerary.
phone, text or email them.
describe some of the highlights they will experience.
use a map to show them the places.   **X**

**Remember a time when you learned how to do something new. Avoid choosing a physical skill, eg. riding a bike. You learned best by:**

watching a demonstration.
diagrams, maps, and charts - visual clues.   **X**
listening to somebody explaining it and asking questions.
written instructions – e.g. a manual or book.

**You are helping someone who wants to go to your airport, the centre of town or railway station. You would:**

go with her.
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Trying or testing it
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**You have to make an important speech at a conference or special occasion. You would:**

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cook something you know without the need for instructions.   **X**
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**You want to learn a new program, skill or game on a computer. You would:**

use the controls or keyboard.   X
talk with people who know about the program.   **X**
read the written instructions that came with the program.
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**Other than price, what would most influence your decision to buy a new non-fiction book?**

A friend talks about it and recommends it.
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The VARK Questionnaire

### How Do I Learn Best?

Questionnaire version 7.1

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**A website has a video showing how to make a special graph. There is a person speaking, some lists and words describing what to do and some diagrams. You would learn most from:**

watching the actions.   X
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**You have finished a competition or test and would like some feedback. You would like to have feedback:**

using graphs showing what you had achieved.    X
using examples from what you have done.
using a written description of your results.   X
from somebody who talks it through with you.   X

**A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:**

take them to a park or wildlife reserve and walk with them.   X
 give them a book or pamphlets about the parks or wildlife reserves.
show them maps and internet pictures.    X
talk about, or arrange a talk for them about parks or wildlife reserves.

**You have a problem with your heart. You would prefer that the doctor:**

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**You are planning a vacation for a group. You want some feedback from them about the plan. You would:**

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### 27Mi Hawthorne 2010

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