

# Open Research Online

---

The Open University's repository of research publications and other research outputs

## Teaching mathematics to children with emotional and behavioural difficulties : the development of practice as a personal journey

### Thesis

How to cite:

Hogan, Susan Elizabeth (2003). Teaching mathematics to children with emotional and behavioural difficulties : the development of practice as a personal journey. PhD thesis The Open University.

For guidance on citations see [FAQs](#).

© 2003 The Author

Version: Version of Record

---

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

---

[oro.open.ac.uk](http://oro.open.ac.uk)

**TEACHING MATHEMATICS TO CHILDREN WITH EMOTIONAL AND  
BEHAVIOURAL DIFFICULTIES: THE DEVELOPMENT OF PRACTICE AS  
A PERSONAL JOURNEY**

Susan Elizabeth Hogan, BA(Hons), BSc, MEd.

“A thesis offered in fulfillment of the requirements for the degree of Doctor of  
Philosophy of the Open University.”

Mathematics Education

March 2003

“Copyright: no part of this thesis may be quoted or reproduced without the author’s  
written permission and without acknowledgement.”

Author No: M0892317  
Submission date: 28 March 2003  
Award date: 29 July 2003

## ACKNOWLEDGEMENTS

This thesis is dedicated to Christine Shiu, my supervisor and teacher, who for many years had overseen the development of my teaching and writing. I am also indebted to Helen Burchell and John Mason, without whom I would not have been able to articulate my developing theories.

### Note on Gender

Throughout this thesis, I mainly refer to the teacher as female and the pupil in alternate chapters as female and male. I use the term 'children' when speaking in general of those with EBD but 'pupils' or 'students' when referring to my classroom or teaching.

## ABBREVIATIONS

AD	Assertive Discipline
ADHD	Attention Deficit Hyperactivity Disorder
BIP	Behavioural Interactionist Perspective
DES	Department of Education and Science
DfEE	Department for Education and Employment
EBD	Emotional and Behavioural Difficulties
EBSD	Emotional, Behavioural and Social Difficulties
GCSE	General Certificate of Secondary Education
PE	Physical Education
PSE	Personal and Social Education
SAT	Standard Attainment Test
SEN	Special Educational Needs
SENCO	Special Educational Needs Co-ordinator

**TEACHING MATHEMATICS TO CHILDREN WITH EMOTIONAL  
AND BEHAVIOURAL DIFFICULTIES: THE DEVELOPMENT OF  
PRACTICE AS A PERSONAL JOURNEY**

**ABSTRACT**

Children with emotional and behavioural difficulties (EBD) are often characterised as ‘challenging’ and ‘unteachable’. The purpose of this thesis is to demonstrate how one teacher’s personal enquiry into her practice reveals an alternative perspective on teaching mathematics to children with EBD. If it is accepted that the mathematics classroom is challenging to the child then the role of the mathematics teacher becomes one of developing a trusting relationship with the child based on the teacher’s use of empathy and ‘being there’. It is important for the mathematics teacher to take risks in using mathematics to overcome the emotional and behavioural difficulties of the child. The message is that researching one’s own practice is a valuable exercise for any practitioner.

<b>ACKNOWLEDGEMENTS/ABBREVIATIONS</b>	ii
<b>ABSTRACT</b>	iii
<b>CHAPTER 1: BACKGROUND AND CHRONOLOGY</b>	1
<b>1.1 PERSONAL CONTEXT</b>	1
<b>1.2 CHRONOLOGY OF TEACHING EXPERIENCE:         THE SCHOOLS</b>	2
1.2.1 Introduction	2
1.2.2 Early Days: Mardell School	3
1.2.3 The Interim: Breesedale School	4
1.2.4 Home: Canfield School	5
1.2.5 Assertive Discipline	6
<b>1.3 THE DEVELOPMENT OF THE CENTRAL RESEARCH         QUESTION</b>	8
1.3.1 Introduction	8
1.3.2 The Child with EBD	9
1.3.3 Conditions	13
1.3.4 The Motivating Quality of Mathematics	14
1.3.5 The Final Stage	14
<b>CHAPTER 2: LEARNING FROM THE LITERATURE</b>	19
<b>2.1 INTRODUCTION</b>	19
<b>2.2 MATHEMATICS AND THE THEORY OF LEARNING</b>	20
2.2.1 Introduction	20
2.2.2 Knowledge and Understanding of Mathematics	20
2.2.3 Relationships	23
<b>2.3 SPECIAL EDUCATIONAL NEEDS</b>	24
2.3.1 Introduction	24
2.3.2 Inclusion	24
2.3.3 Uninformed Impressions	25
2.3.4 Informed Impressions	27
<b>2.4 EMOTIONAL AND BEHAVIOURAL DIFFICULTIES</b>	30
2.4.1 Introduction	30
2.4.2 Behavioural Approach	30
2.4.3 Ecosystemic Approach	33
2.4.4 Psychodynamic Approach	35
2.4.5 Weil-Kayley: Victoire Sur Les Maths	40
2.4.6 Classroom Practice	41
2.4.7 Summary	42
<b>2.5 REFLECTIVE PRACTICE</b>	44
2.5.1 Journal Writing	44
2.5.2 Critical Inquiry	46
2.5.3 Summary	47
<b>2.6 MATHEMATICS AND EBD</b>	48

2.6.1 Pupil Needs	48
2.6.2 Constructivism	48
2.6.3 Real Mathematics	50
2.6.4 Summary	52
<b>2.7 EMOTION THEORY</b>	53
2.7.1 Introduction	53
2.7.2 Lazarus and Cognitive-Motivational-Relational Theory	54
2.7.3 Application	56
2.7.4 Frijda	57
2.7.5 Zajonc	58
2.7.6 Summary	59
<b>2.8 CONCLUSION</b>	60
<b>CHAPTER 3: METHODOLOGY</b>	63
<b>3.1 THE FRAMING OF A METHODOLOGY</b>	63
3.1.1 Introduction	63
3.1.2 Experience-Led Approach	66
<b>3.2 EPISTEMOLOGY</b>	67
3.2.1 Introduction	67
3.2.2 The Lone Journal Writer	68
3.2.3 The Vulnerable	69
3.2.4 Self-Development	71
<b>3.3 MY PRACTICE</b>	79
3.3.1 Personal Values	79
3.3.2 Temporary Confusion	82
3.3.3 Change in Attitude	84
3.3.4 Interactions	85
3.3.5 Imaginative Mathematics	90
3.3.6 Attitudes	93
3.3.7 Motivation: Summary of My Practice	95
3.3.8 Summary of Research Assumptions	97
<b>3.4 CRITICAL KNOWING</b>	97
3.4.1 My Engagement with Constructivism	97
3.4.2 Implications and Intentions	98
<b>3.5 SHIFTS IN EMPHASIS</b>	101
3.5.1 Working Research	101
3.5.2 Messages	102
3.5.3 The Nature of Emotion	103
<b>3.6 RESEARCH DIARY</b>	104
3.6.1 The Purpose of Diarising: An Overview	107
3.6.2 Reflecting on Practice	109
3.6.3 Critical Incidents	111
3.6.4 Development of Teacher-Pupil Relationships	116
3.6.5 The Process of Questioning and Conjecturing	124
3.6.6 Summary of Research Diary Method	129

<b>3.7 ACTION RESEARCH</b>	130
3.7.1 Initiation	130
3.7.2 Research Community	134
3.7.3 Extending the Concept	136
3.7.4 Conditions for Successful Action Research	138
<b>3.8 THE DATA SELECTION PROCESS</b>	139
3.8.1 Conceptual Framework	140
3.8.2 Choice of Subjects	141
3.8.3 Pupil Diaries	142
3.8.4 Interviews	147
<b>3.9 VALIDITY</b>	148
<b>3.10 SUMMARY: KNOWLEDGE AND UNDERSTANDING</b>	152
<b>3.11 CONCLUSION</b>	153
<b>CHAPTER 4: KEY PRINCIPLES AND FINDINGS</b>	156
<b>4.1 INTRODUCTION</b>	156
<b>4.2 CLASSROOM ENVIRONMENT</b>	156
4.2.1 Stimulation	156
4.2.2 Curriculum	160
4.2.3 Enablement	162
4.2.4 Stress and Stimulus	164
<b>4.3 RELATIONSHIPS IN THE CLASSROOM</b>	169
4.3.1 Shifting Locus of Control	169
4.3.2 A Perception of Success and Failure	172
4.3.3 Effective Choice for Pupils	175
4.3.4 The Search for Stimulation	177
4.3.5 External Judgements	179
<b>4.4 TAKING MATHEMATICS OUT OF THE CLASSROOM</b>	181
4.4.1 Rationale	181
4.4.2 Mathematical Activity	183
4.4.3 Frogs and Toads	184
4.4.4 Limiting Choices	187
4.4.5 A Practical Activity: Bricks	189
<b>4.5 PRINCIPLES OF TEACHING AND LEARNING</b>	190
<b>4.6 KEY FINDINGS</b>	193
4.6.1 Introduction	193
4.6.2 Social Learning	193
4.6.3 Increasing Stimuli	195
4.6.4 Accessibility of Mathematics	196
4.6.5 Importance of Teacher-Pupil Relationship	198
4.6.6 Summary	199
<b>4.7 CONCLUSION</b>	199

<b>CHAPTER 5: THEMES</b>	<b>201</b>
5.1 <b>CONDITIONS</b>	201
5.2 <b>THEMES</b>	205
5.2.1 Risk-taking	206
5.2.2 Instincts	210
5.2.3 Common Ground	214
5.2.4 Voluntary Risk	215
5.2.5 Content and Method	219
5.2.6 Trust and Risk-taking	221
5.2.7 Flexibility	223
5.2.8 Choice	226
5.2.9 Empathy	230
5.2.10 Socialisation	230
5.3 <b>CONCLUSION: DISTANCE AND PROXIMITY</b>	231
<b>CHAPTER 6: CHALLENGE AND RESPONSE</b>	<b>235</b>
6.1 <b>INTRODUCTION</b>	235
6.2 <b>THE CHALLENGING CLASSROOM</b>	235
6.3 <b>SELF-KNOWLEDGE</b>	239
6.4 <b>APPLICATION TO PRACTICE</b>	241
6.5 <b>LIMITATIONS OF THIS WORK</b>	242
6.6 <b>FUTURE DEVELOPMENT</b>	243
6.7 <b>AN END TO THE JOURNEY</b>	244
<b>CHAPTER 7: FURTHER REFLECTIONS</b>	<b>246</b>
7.1 <b>INTRODUCTION</b>	246
7.2 <b>THEORETICAL PERSPECTIVES</b>	246
7.2.1 The Therapeutic Tradition	246
7.2.2 Rogerian Psychology	249
7.2.3 Cognitive Behaviourism	249
7.2.4 Attribution Theory	250
7.3 <b>DEFINITIONS OF EMOTIONAL AND BEHAVIOURAL DIFFICULTIES</b>	251
7.4 <b>METHODOLOGY</b>	253
7.4.1 Epistemological Assumptions	253
7.4.2 Quality Criteria	255
7.5 <b>CONCLUSION</b>	256
<b>APPENDIX 1</b>	<b>257</b>
<b>REFERENCES</b>	<b>259</b>



**FIGURES**

2.7.2 The Generation of Emotion	56
2.8 Co-emergence of Theory and Practice	61
3.1 Timetable of Research Methods	64
3.3.4 Interactions	86
3.7.1 Action Research Spiral	131
3.7.3 Theoretical Framework	138
3.8.1 Main Research Areas	140
6.2 Classroom Discourse	238

## CHAPTER 1: BACKGROUND AND CHRONOLOGY

### 1.1 PERSONAL CONTEXT

The subject of my thesis – teaching mathematics to children with emotional and behavioural difficulties (EBD) – is essentially personal, centred as it is on my practice. Therefore, I have not chosen the subject; it has chosen me. Or, in a sense, I am the subject.

This is the story of my quest to develop my practice, in relation to children with EBD, through the emergence of personal theories uncovered by research and reflection. This research is ongoing; as long as I teach I expect to be developing my practice. For the purpose of this thesis, the research covers the period of 1996-2002, a total of six years.

It is important to distinguish the times when I am peripheral to the research and the times when I am central to the research. As a practitioner researcher, one might assume that I am always at the centre of the enquiry because I am the enquirer. When I am interpreting the behaviour of a student, I am necessarily considering my impact on that behaviour. The various threads of enquiry – personal, environmental, interactional and holistic – entwine to form a multiperspective on my *practice*, which I define as everything that goes on in my classroom. My enquiry began with me as researcher-practitioner and gradually moved towards a focus on researching my own practice. The subtle difference between the two rests on a growing awareness of an entity called *my practice*.

In particular, it is interrelationships that have proved to be of greatest significance.

Children with emotional and behavioural difficulties are most conscious of the interplay between emotions and the learning environment – I, as their teacher, act as a catalyst

between the two in desiring to lead the children towards certain mathematical objectives while, at the same time, considering the emotional dimension.

A successful teacher of pupils with EBD is expected to possess almost superhuman qualities: the ability to create a climate of trust, care for the pupils unconditionally, empathise with them, “be flexible, subtle yet honest, tolerant, patient and forgiving...calm, even tempered, good humoured...skilled at diverting children from feelings of anger, despair etc.” (Daniels, Visser, Cole and de Reybekill, 1999)

Not surprisingly, it takes a great deal of time and effort (and many mistakes) to become that skilled – and it is a skill (as opposed to an innate quality) that can be learned, although some may find it easier than others.

In my thesis, I am not attempting to promote a definitive way of teaching mathematics to children with EBD. Rather I am chronicling my own journey of experiences, from which others may learn, as I have, how it is possible to develop a personal approach to teaching in this area.

## **1.2 CHRONOLOGY OF TEACHING EXPERIENCE –THE SCHOOLS**

### **1.2.1 Introduction**

My intention in this chronology is to give some idea of the teaching context of the research over different periods of time. (All the names of people and schools have been changed.)

Mardell School: April 1996 – July 1998

Breesdale School: September 1998 – July 1999

Canfield School: September 1999 – July 2002

### **1.2.2 Early Days: Mardell School**

Mardell School is a mixed secondary school for youngsters with emotional and behavioural difficulties. When I began teaching mathematics to all the pupils in April 1996, they numbered 21 with 6 girls and 15 boys (although two of the girls had stopped attending). Also, the top class in the school was Year 10 because the school opened in 1994. The local authority imposed a planned increase in numbers to 56 over the next two years. Consequently, the school never reached a point of stasis, or equilibrium, in those two years because it was continually growing and evolving, requiring its members to adapt to the changing environment. From a research standpoint, it became necessary to adopt a fluid framework of exploratory research, eventually concentrating on a core of pupils from one form, three of whom (David, Damien and George) remained constant throughout the period.

From a personal viewpoint, I knew little about emotional and behavioural difficulties as I had previously taught only in mainstream schools. Therefore, the first year was a steep learning curve for me. I began to read and research in tandem, using a diary as my main research tool. My method of enquiry was recording fragments of my practice as I perceived it. My practice grew in relation to my experience.

My task, in these circumstances, was to ‘build up’ the mathematics department by

resourcing it fully, developing the curriculum and writing schemes of work and other policies. I prepared the first GCSE cohort for examination in June 1997 with gratifying result. In February 1998, the school passed its first OFSTED inspection.

### **1.2.3 The Interim: Breesdale School**

At the time (September 1998) that I took promotion to the post of Mathematics Teacher and Head of Year at Breesdale School, this mainstream school was in special measures and, at a capacity of 800, was undersubscribed at approaching 600 pupils. The new school year brought with it a new Head Teacher and the expectation that the school would be out of special measures within the year. (In fact, this took two years to achieve because attendance figures and behaviour did not improve sufficiently.)

The school had been under threat of closure, which explained its falling rolls. By the time the County Council decided to close another school in the area, Breesdale's reputation had been damaged. Changeover of staff was high, morale was low and the pupils were obviously unsettled and lacked respect for their teachers. Behavioural difficulties were widespread but a number of children (some statemented, some not) also had emotional difficulties. Most children were underachieving and suffered from low self-esteem.

The children needed a tremendous amount of positive input but poor attitudes made them extremely demanding and difficult to praise. They were hurt and needed someone to blame; unfortunately their target was usually a teacher.

A visit from an inspector was a common occurrence due to the nature of the school. As teachers we observed each other's lessons in an attempt to raise the quality of teaching.

The Mathematics department, consisting of five teachers, enjoyed strong leadership but, unfortunately, the Head of Mathematics left the school in January 1999, leaving the department effectively leaderless – his responsibilities were shared by his former colleagues. I did not feel that I could continue to teach under such conditions, although I had found it a fruitful ground for my research.

#### **1.2.4 Home: Canfield School**

From September 1999 to the present, I have taken the role of leading the mathematics curriculum at Canfield School (a residential boys' EBD school), sharing the mathematics teaching with two other teachers.

The school intake is part residential and part day pupils, 64 on roll with approximately 23 residential. However, it seems to be the lot of EBD schools that their intake is rarely stable; boys of all ages are referred to the school throughout the year. Canfield School is able to cope with these changes because it has a well-established induction process and an effective whole school behaviour policy. Expectations of behaviour are high and sanctions are consistently applied.

I feel that here is where I have 'come home' in the sense that arriving at this school represents the end of a phase of my journey – the culmination of a search for questions and answers about my practice. Also, the moves between these three schools crystallised my developing views about where pupils with EBD are best taught. While there exists two separate worlds, that of 'mainstream' and 'special', some pupils will always need to be taught in the more therapeutic environment of a special school, where they can receive more individual attention.

### 1.2.5 Assertive Discipline

The behaviour management practice, adopted to a lesser or greater extent by each of the three schools, is Assertive Discipline (Canter & Canter, 1992). As the terms used within this practice are mentioned throughout this thesis, it is necessary, for an understanding of later sections, to explain them here.

Assertive Discipline was the behaviour management system adopted by Mardell School in January 1996. Some teachers at the second school, Breesdale School, also used it. The purpose of this section is to describe how I used Assertive Discipline (AD) at both schools, as it will aid interpretation of some of the evidence later.

AD is based on a behaviourist approach to discipline: the child is seen as choosing to behave the way that she does and can choose not to behave that way. A minimum number of rules (positively expressed if possible) are set in place: if they are followed rewards are due; if they are broken, a hierarchy of consequences results.

Mardell School had four rules, which were displayed around the school, making them visible at most times:

Do as you are asked.

Keep hands feet and objects to yourself.

No swearing, teasing or name-calling.

Be in the right place at the right time.

Rewards took the form of merits or positive messages home, which were written on a daily record sheet. Merits were also present at Breesdale and Canfield schools but unusually, at

Mardell pupils could buy material goods with their merits. These ranged from a pencil case to a meal out with a member of staff.

The *tick system* sets AD apart from other systems. When a rule is broken the pupil's name is written on the board. This represents a warning to the pupil who is expected to change her behaviour. A second transgression, however, warrants a tick beside the name and a loss of merit. Further transgressions add increasing amounts of detention time (2 minutes for 2 ticks, 5 minutes for 3 ticks, 10 minutes for 4 ticks) until at 5 ticks a senior member of staff is called and the pupil is removed. This is called a *Senior* at Mardell School.

A pupil is *on a Severe* if behaviour is severe enough to stop the teacher from teaching, or pupils from learning, and includes dangerous behaviour, racial abuse and leaving class without permission. In such a case, the member of staff bypasses the tick system and calls for a senior member of staff.

To summarise, the aim is for rewards and deterrents to work together to make acceptable behaviour the most attractive option for the pupils.

However, in the world of EBD nothing is so straightforward. For some children it is more stimulating – or ‘fun’- to misbehave: for example, sneaking out for a cigarette is worth a ten-minute detention. Consistent application of the system is difficult when interpretations of behaviour differ from teacher to teacher and between teacher and pupil. Pupils learn to ‘work the system’ and will seize upon any inconsistency, manipulating the situation to their advantage.

At least with a whole school behaviour policy based on AD the senior management have a daily support role around the school. At Breesdale School, AD had been trialled but not



adopted by the whole school. Individual teachers used it with difficult classes. When other methods of discipline failed, I tried AD with a few of my classes. Merits were not given freely at Breesdale, so I decided that name on the board meant loss of merit and each tick represented 5 minutes' detention, which I imposed the following day. This was not successful in improving the behaviour of most children; they continually pushed the boundaries and detentions were difficult to enforce, as there was ineffective support from senior management.

Some teachers at Canfield School also used their own tick system as a way of tracking the behaviour of children in their classes but it is not adopted as a whole school policy. At Canfield, teachers have more freedom to decide the consequences of minor infringements.

It is interesting to note that the teachers at Mardell School moved away from a strict adherence to Assertive Discipline after two years of revisions to the original policy.

### **1.3 THE DEVELOPMENT OF THE CENTRAL RESEARCH QUESTION**

#### **1.3.1 Introduction**

Upon entering Olive's classroom, a young student teacher on her first visit to a primary school surveyed the groups of calm, attentive children until her eyes met a striking individual, head bent with a mass of orange curls. At that moment, the head lifted and a scream rent the air as she turned on the boy sitting next to her. An assistant moved towards her but she pulled away into a corner, banging her head repeatedly against the wall, the mass of orange curls shaking, until she allowed an arm to be placed around her and ease her gently away. Taking the student teacher to

one side, Olive explained that the girl had 'problems' and that this happened sometimes when she lost her temper.

Twenty years later, I can recognise this as my first encounter with a child with special needs; those particular needs we now call emotional and behavioural difficulties. I knew nothing of the problems of the girl with orange hair but felt at the time (instinctively) that the primary school classroom was not the right place for her. The disturbed child cannot help but disturb; I could only see this as a problem for both teacher and pupils. Having moved from a position of ignorance to one of greater (though not complete) understanding in that span of twenty years, I can see that the present climate of inclusion has echoes in the past. A skilled and experienced teacher such as Olive was able to meet the educational needs of her pupils and attempt to socialise them all while at the same time broadening their interests. My own experience has taught me that inclusion is something to strive for but is not always appropriate. Using this experience as a lens through which I can view the particular events that I have chosen to record, I can see that similar emotional outbursts have been more easily accommodated in a special school for pupils with EBD, where caring staff have the time and commitment to talk through the child's feelings with her. Few members of staff in a mainstream school have the luxury of such opportunity.

I developed a set of research questions (in order to focus my research) against a background of 'disturbance' (due to difficulties in applying the behaviour management system) in the first setting, Mardell School.

### **1.3.2 The Child with EBD**

Teachers learn to deal effectively with behavioural problems; what they cannot know is the history of emotional antecedents in the way that the child who has experienced them does.

In my experience, the child with emotional difficulties has suffered from 'poverty of care' (or lack of nurturing) at some point in their lives and may still be in this position. I developed this hypothesis in the first few months of teaching and reading the literature on EBD. I use 'poverty of care' as distinct from economic poverty, although this also exists in many cases. This state invariably engenders low self-esteem. The consequent 'acting out' behaviours, which label the child EBD, can be traced back to a learned devaluation of self. The self-concept, built from various conceptions of the self which result from interactions with significant others, drives the child to destroy that which is external to her. The child who tears up her work, or vandalises a classroom, is expressing insecurity because of the challenge they represent to her self-concept. Let me take George as an example: in this case lack of consistent care resulted from his mother's frequent hospitalisations; his self-concept developed from his treatment by others as "the boy with the mother in a wheelchair". He seemed unaware of his unkempt appearance so lashed out at anyone who referred to his 'difference'. George was excluded from his primary school and sent to a new special school (Mardell), one of only four children when he joined the school. In Year 7 George reacted to the classroom like a caged animal, leaping from table to table, swinging from the ceiling supports, refusing to sit with the others. In time he came down to ground level, roaming the classroom but still refusing to sit down. Later, when he did sit, he had to swing back on the chair; any work that he did he tended to destroy. By the time he entered Year 10 George had met success in certain areas, one of which was mathematics (for example, in his SATs, achieving level 5).

The following extract from the research diary illustrates the role of affect (particularly emotion) in the learning of mathematics and how a research question developed from consideration of such episodes.

Mardell Diary: Wednesday 16<sup>th</sup> July 1997

Brilliant lesson at the end of the day – a real “feel-good” lesson.

Damien and George had had a terrible fight in the morning – Damien had kicked George in the face, resulting in a swollen and bruised eye and you could see the marks of his shoe on George’s forehead. However, in this lesson they played together.

In the afternoon I had Fay [classroom assistant] with me and we played “Crossing”. Damien played with George and David with Freddie (and later I joined in to make a threesome). They were busy chatting while I got the boards and counters out and left them on their tables. One of them asked, “How d’you play then?” – Damien I think – so I explained to Damien and George that you throw the dice and move any of your three counters to the finish. If you land on the “No parking” zones you have to go back to the beginning. The first person to get all three counters to the Finish won. I varied it after a couple of games by allowing them to place their counters anywhere along the Start to see if it made a difference to the result.

After I finished (or not quite finished) my explanation to each pair they said hurriedly, “OK. I get it. Come on, let’s get started”, seeming impatient to get on with the game. All four got very excited. They were obviously in a good mood. David kept up a running commentary on his game as though it were a horse race: “And he’s thrown a four and he’s coming up to six – no he’s not!” [It’s a no parking zone]. I started giggling as it was quite funny and Freddie joined in. Meantime, George and Damien were shouting out every time they got a counter to the finish. Fay was watching them joining in with the excitement but when one of them won they yelled over to me (on the other side of the classroom with David

and Freddie) “Miss, look, I’ve won!” Fay was putting the scores on the board although we weren’t actually bothered.

David kept up his commentary and I was laughing at him and acting delighted when I got a counter home. We sustained the game for the whole lesson and I said how pleased I was with them.

At the end of the day I reported on the lesson to show that Damien and George had made up. “It was a really good lesson, wasn’t it Fay? I said at the end. “Yes, we all loved each other!” she replied.

Damien was excluded for one day and Mandy [Home-school liaison] visited him Wednesday evening and he was naturally upset. “But we had a really good maths lesson at the end of the day!” he protested and Mandy relayed this to the staff at Thursday morning’s briefing with a wry smile. It was a pity but this [ie. the maths lesson] did not make up for his vicious attack on George earlier.

The above extract illustrates the role of *play* in creating a mood conducive to social learning. Here, pupils’ positive affect is engaged. Teaching students how to play together is one strategy for engaging pupils in mathematics. I searched the data (mainly the research diary at this time) for other strategies or conditions for success. I then became aware that a level of success was apparent in mathematics that was not present in other subjects. I measured success by pupils’ attendance, behaviour and amount of work done as compared to English, French and RE lessons particularly. At the end of every day, the staff met to discuss the day, which was how I was able to make comparisons. Therefore, I felt it pertinent to ask the question: what determined the pupil’s ability to connect with mathematics despite a high level of emotional difficulty? This was formalised into my first

research question: *Under what conditions does mathematics become most accessible to pupils with emotional and behavioural difficulties?*

### 1.3.3 Conditions

Concentrating on the concept of accessibility allowed me to observe the strategies pupils use to connect (or otherwise) with mathematics in their interactions within the classroom.

A search of the data (diaries and interviews) revealed conditions, which I then used to inform future research and develop further questions.

These conditions amounted to recurring themes in the data and are listed below:

- a) Trust – needs to exist between teacher and pupil and, also, pupil and pupil.
- b) Praise – compared to affirmation; the place of praise in my classroom.
- c) Ability – mathematical ability of students.
- d) Expectations – of teacher and pupils and outsiders.
- e) Differentiation – in my approach to teaching individuals.
- f) Novelty – in my presentation of mathematics.
- g) Flexibility – in my approach to teaching individuals.
- h) Attitude – of pupils towards mathematics.
- i) Security – felt by students in the classroom.
- j) Motivation – of teacher to teach and pupil to learn.

(A full explanation of these conditions appears in Chapter 5)

### 1.3.4 The Motivating Quality of Mathematics

In my attempts to find what lay behind pupils' actions in the usual teaching context of the classroom, an awareness developed that the mathematics *itself* could be a principal motivating force. The activities that took place every day within the mathematics lesson could absorb the pupils for the allotted time, engendering positive attitudes and high expectations of themselves and others. Having left the special school, which I had studied for two years, for a mainstream school in special measures (in September 1998) the context had changed but the research focus remained the same. I was now able to compare similar pupils in the two situations and shape a more general question for the particular circumstances: *To what extent can mathematics be used to motivate pupils with emotional and behavioural difficulties?* (March 1999)

The above question implies that it is possible to quantify how much mathematics can be used to motivate and when it cannot be used to motivate pupils. In that sense, an inability on my part to make such a statement at the end of the research could deem the study a failure, or at best inconclusive. The children have steered the research by their responses to my questions and generated many possible hypotheses. At the time I felt that a more general title would suffice: *A case study of learning mathematics through the eyes of children with emotional and behavioural difficulties* (June 1999). This represents a shift in focus away from my practice, which is why I eventually rejected it as a research question because I was predominantly looking through *my* eyes, not the children's.

### 1.3.5 The Final Stage

A series of research questions have been outlined, each reflecting a stage in the development of the research, linked to the context (school) in which I was working but also

linked to my development as a special needs teacher. The teaching informed the research and, correspondingly, the research informed the teaching. One year on (in 2000) I found it helpful to reflect on what answers might look like to those questions:

*Conditions for successfully teaching mathematics to children with EBD include...*

*Factors that motivate children with EBD to learn mathematics include...*

*Children with EBD learn mathematics by...*

It seems that the questions themselves presuppose a quantitative answer (as with the 10 conditions in 1.3.3), which is unintentionally prescriptive on my part. Now I recognise that I have altered my perspective and cannot claim to be able to see ‘through the eyes’ of the children whom I teach. I have taken their experiences, placed them at the foreground of my emotional landscape and examined them through the lens of my own emotional biography. Therefore, I relate to their experiences through my own experiences. It is a question of ‘search and match’; a process of empathy but more than a ‘*feeling in*’, an introjection (though sometimes conscious) of (their) pain. It was not realistic to claim the child’s perspective alone, only my own interpretation of it. This shift could only come about through further reflection. In the main, I am not aware of the process until later when I have time to reflect. However, there must be an unconscious “knowing in the moment” (Mason and Spence, 1999: 151) in that I am sensitive to the emotional state of the child, therefore I must be continually in a state of readiness to attend to the child. I think that this attention to the child’s emotional vulnerability comes about through a greater understanding of my own emotional state in relation to the child. This represents a shift from focusing on ‘external’ questions to a focus on my practice.

Stuart is a case in point. He is in a unique position because I taught him at Mardell School when he was in Year 7 and then at Canfield School in Years 9 to 11. From experience, I



know that Stuart finds it difficult to enter a classroom and then to stay in that room. In Year 7 he would often stand outside the room and refuse to come in. He was wary of adults and formed no close attachments. On the few occasions that he did attend lessons, he proved to be quite able at mental arithmetic and, also, particular about his presentation.

Having become a boarder at Canfield School in Year 8, he feels safe enough to attend most lessons but during Year 9 had difficulties crossing the threshold, preferring to accompany a support teacher. I am aware of Stuart's emotional biography and why he behaves as he does. Stuart has rituals; for example, the first piece of paper he uses is screwed up ("I done it wrong") and thrown in the bin as he crosses the room for another piece of paper.

He works best one-to-one with an adult. He adores the adults at the school – his small frame can often be seen hanging from their shoulders. If he has arguments they are with other children.

*Knowing-about* Stuart means that I *know-to* act in certain ways around him because I am aware of his emotional needs. This is a question of showing my sensitivity to his emotional state and introjecting his pain.

During Year 9 our interactions were predictable. On meeting he sidled up to me and asked if he could work in a different classroom. I was tempted to agree as I know that he would get more work done away from the others but so would any member of the class. (They took turns to work in the I.T. room, though not always on the computers.) If it was not his turn or if I had planned some group work or a whole class activity, I would say 'no'. If it was his turn and the boys were working individually, I would say 'yes'. He would take his books with him and work with the special needs teacher (who was also his form tutor).

During Year 10, with the death of his tutor, Stuart no longer asked to work elsewhere.

The classroom is made physically ready for him in that materials are prepared and at hand and the work for the lesson is planned. Equally, I must prepare myself emotionally for Stuart. The best way for me to treat Stuart is to allow him to play out his rituals – in the meantime I can attend to others in the class – and then make myself available to him by sitting with him and watching him work for a while. It may be that a support teacher is present and able to help Stuart – obviously I cannot be with him all the time. Yet, although all children with EBD are demanding, their needs are quite individual.

Some children prefer to be left alone to work and do not feel comfortable with me standing over them. Others, like Stuart, prefer constant support (and sulk if they do not get it).

However, in order to manage the room effectively, I balance my needs and theirs by moving between individuals and groups to check on progress. Where suitable, I lay down ‘bets’ to see if they can beat a ‘world record’ or I tell them that I know that they will not be able to find something. Encouraging competition can help children to persevere with an exercise. Also making up examples for a partner or another group to solve is a motivating factor *and* helps with socialisation.

I have used the example of Stuart as a microcosm of my journey and his journey with me. Stuart has journeyed through his years at secondary school in parallel to my journey. He was there at the beginning and is there at the end. It is possible for me to chart my journey through Stuart alone (although I have not chosen to do this as there are so many other cases to write about).

The full story of the development of ‘my practice’ will be told in the following chapters.

Now that I see the development of the research question as a journey, I have decided that the most suitable title is, *Teaching Mathematics to Children with EBD: the development of my practice as a personal journey.*

## CHAPTER 2: LEARNING FROM THE LITERATURE

### 2.1 INTRODUCTION

The broad area covered by this chapter encapsulates part of the mathematics education literature and part of the literature on emotion and behaviour. In my search of the literature, I was hoping to find an overlap between the two - ie. mathematics education for children with EBD – but failed to find one. Therefore, I will attempt to synthesise these two areas. I found that certain writing resonated (strongly or otherwise) with my reflections on my practice. Other writing struck a lower chord.

My aim was (is) to take from the literature that which

- a) explained,
- b) confirmed,
- c) justified,
- d) evidenced,
- e) challenged,
- f) informed
- g) and advanced my practice.

Therefore, rather than reviewing the literature, I shall demonstrate how the literature formed part of a learning process for me and the effect this process had on my practice. From a limited experience base early on in my reading I developed greater powers of interpretation as my experience grew. I will demonstrate how the quality of other writers' work and my ability to connect with it had the effect of moving my practice on.

First, I will indicate the literature that provided the weakest connection to my practice. This literature is included because I responded to it in trying to make a connection.

Secondly, I will discuss the literature that resonated with my experience. These were works that explained, confirmed and justified my existing practice and also provided evidence that what I was doing concurred with others in the field.

Lastly, I will review the literature that provided strong enough links to my practice to cause a shift in my position as a teacher/researcher. Works that challenged my perception of my practice, which threw light on alternative ways forward and provided new possibilities for approaching my teaching, led me to a greater understanding of my practice. Reading this literature put me in a position to take new ideas on board and eventually 'own' them so that they became an integral part of my beliefs about teaching.

## **2.2 MATHEMATICS AND THE THEORY OF LEARNING**

### **2.2.1 Introduction**

In this section, I review the literature that provided only a tentative link to my practice. However, these works are worth mentioning because I attempted to interact with them as a possible explanation for my practice.

### **2.2.2 Knowledge and Understanding of Mathematics**

I found it difficult to respond to the works that I read in this area due to the lack of an obvious connection to my experience of mathematics teaching. In works that are highly theoretical, I find it more difficult to translate theory into practice. For instance, on reading

Polyani's treatise on personal knowledge I made but a tentative connection with his conflation of belief and truth.

“Truth is something that can be thought of only by believing it.” (Polyani, 1964: 305)

By this Polyani infers that an outside observer cannot compare the observed person's knowledge of truth with the truth itself – he can only compare the observed person's knowledge of the truth with his own knowledge of it. This means that one cannot compare subjective knowledge with objective (or consensual) knowledge except in the sense of judging the other person's beliefs from the point of view of our own beliefs.

The implications for my own research became evident when I used the research methods of observation and video recording. My interpretations of the videotape were then compared to the participants' interpretations on viewing the tape as a form of triangulation. This helped me to make progress with my research but did not provide a deeper understanding of my teaching. The attempt to reach an external reality in these situations is driven by the co-meaning of belief and truth, to which each individual arrives through their emotions. Each person is not looking at the same objective reality but at his or her subjective interpretations of it. Here emotions play the main role in interpreting actions because behind the actions lie the affective motivations for those actions.

Polyani states that mathematics particularly has ‘emotional colour’ (Polyani, *ibid*: 188). By this he means that the ‘heuristic science’ of mathematics is driven by personal passion for discovery.

For Polyani the personal transcends the subjectivity/objectivity divide. Subjective beliefs (convictions accrediting the facts arising from personal passion) can only be viewed non-

committally by someone not sharing them. Going back to the example of triangulation, I have witnessed pupils interpreting their behaviour through an emotional reaction to watching it on videotape. Theirs is a subjective interpretation of their own motivations. They are trying to justify their behaviour, which may be motivated by a lack of understanding of mathematics.

“The joy of grasping mathematics induces the mind to expand into an even deeper understanding of it.” (p.321)

It is the sense of being unable to ‘grasp’ mathematics (or connect with it) that leads to a lack of understanding and frustration. It is, of course, the teacher’s task to help pupils make that connection. When mathematics *is* grasped, I would hope that it leads to greater understanding and raised self-esteem.

Winnicott (1971) identified the potential space between the subjective object (me) and the object objectively perceived (not-me) that can be filled by transitional objects, such as the breast or teddy bears for a baby. In extending the concept to mathematics, certain mathematical objects (physical or symbolic) can take the role of transitional objects, leading the child towards a greater understanding of the concepts being learnt (Tahta, 1996). The loss being compensated here is the loss of certainty in the child. For instance, Chris understands arithmetic but has problems knowing the value of  $n$ . He asks what  $n$  means and cannot accept that it could stand for any number. When I place it in the context of money he is able to believe in and know the value of  $n$ . The teacher’s choice of objects is crucial in establishing a successful outcome. The teacher’s task here is to invest the symbols with meaning appropriate to the child. According to Mason (1980), the symbol only has meaning for Chris when it codifies or represents his previous practical experience and becomes an enactive element.

### 2.2.3 Relationships

Nicodemus (1993) (in an adult context though applicable to children) places a strong emphasis on the link between relationships in life and relationships in mathematics. For example, for some children attempting to cognise the relationship between parts of a whole and the whole object may have an emotional significance due to the break up of their parents' relationship. Emotional associations can lead to blocks in learning, which can be dismantled by a two-way interaction between the teacher and the learner. However, I do not agree that internalising concepts about number requires the learner to have a clear sense of self. The learner needs to be able to separate "inside from outside" (Nicodemus, *ibid*: 25). Only a secure sense of self enables the learner to take risks. I disagree – I can take risks on behalf of the learner and show him the way to move forward in his learning by taking risks (See 5.2.1).

Mathematics can be interpreted as a means to internal stabilisation when thoughts are diverted from emotional problems towards introjection of mathematical objects. Much of mathematics represents change – shape, position, movement – and has equivalences in human relationships. Change is associated with insecurity.

Sutherland (1993) states that disruptive 'acting out' can be one form of symbolising for the child not able to symbolise internally. I agree that teaching needs to confront the resistance to knowledge, not just the lack of it; it is the child's refusal of information, rather than ignorance of it, that is often the issue. The concurrent behaviour – eg. continually asking for help – reveals a lack of confidence and a fear of exposure that comes with engaging with mathematics. It places the teacher in a unique position. As Sutherland states, the teacher takes on the parental function of containing excessive anxiety in order to help the



student cope with the uncertainties associated with learning. This has some associations with the concept of *being there* (which does not include modelling by the teacher) which I elaborate later in the thesis (5.2.9). The teacher shares experiences with the student, helping the student order ideas and thoughts. As a result, the learner picks up the teacher's capacity for reflection.

## **2.3 SPECIAL EDUCATIONAL NEEDS**

### **2.3.1 Introduction**

This section continues with a review of literature on special educational needs (SEN) taken chronologically from the early days of the research, when I had little knowledge of the issues pertaining to SEN, to the present time when my knowledge is greater.

### **2.3.2 Inclusion**

Within the literature on SEN lies a moderately sized section on EBD. However, since inclusion became a salient political issue, many articles in journals and newspapers have been written around the inclusion/exclusion debate (and doubtless will continue to be written). The reification (by the media) of excluded children into a homogeneous group characterised by anomie serves to impose a definition on these individuals for ease of debate yet only succeeds in limiting debate. The metaphorical disaggregation of this group is necessary before a true understanding of inclusion can be reached. In other words, to class every excluded child as the same does a great injustice to the circumstances and special needs of the child. Only when we can free each child from the limitations of such a category can we begin to meet their needs as far as inclusion is concerned.

Writing over thirty years ago, Wolff (1969) identified one means of inclusion for children at risk:

“Increasingly the expectations are that schools and nursery schools should not only compensate children for cultural deficiencies in their own homes but should in addition provide an environment in which generally acceptable social standards can be acquired, especially by children from disorganised families in which these standards are lacking.” (p. 203)

Wolff’s early compensatory model can be compared to curriculum inclusion policy where schools may claim to provide appropriate social models but it has not prevented the exclusion of children. In fact there has been a rapid rise in the exclusion rate through the late 1990s. Special schools (particularly residential) tend to be better at providing a secure community for children with social and emotional difficulties. Also, where nurture groups have been set up in primary or nursery schools, socialising children at a young age, the benefits of reducing emotional and behavioural difficulties are long-lasting (Bennathan, 2001: 12-13).

### **2.3.3 Uninformed Impressions**

During the early stage of my reading in the area of special education, I searched for what might be relevant without being able to judge from the context of experience. I looked to the literature to explain the new context for my practice. I was hoping that it might inform my practice in this new context. For example, the message that I first received upon reading about ‘Exceptional Children’ (Hallahan and Kaufman, 1991) was that most children with emotional and behavioural disorders had a low to normal IQ. I took this knowledge into the interview for my first post in an EBD school, only to be corrected by

the assertion that many of the children did not lack ability but were low achievers due to factors such as missed periods of schooling. I was made to realise the aptness of this assertion when I first tried to teach a Year 10 class and failed because my expectations were too low. With experience, I found that I could expect to find children with great potential in mathematics.

I reacted instinctively to an earlier work by rejecting the author's statement:

“Punishment, sometimes of the physical kind, is yet another way of eliminating undesirable behaviours.” (Westwood, 1987: 18)

Such a statement would not be countenanced in today's political climate, yet we know of institutions where such punishment was meted out through the 1980s and 1990s. Although physical punishment is no longer colluded with, in my experience, a certain physicality can still exist in male-dominated institutions such as boys' schools.

Williams (1985) presents a more enlightened approach in his recognition of self-esteem as an important issue in special needs teaching, which should, therefore, include a variety of teaching methods and materials. This caused me to make a re-connection with Coopersmith and Feldman (1974) pioneers in the field of self-esteem, which I had read as part of an earlier higher degree and whose findings are still relevant today (Coleman, 2001). On re-reading Coopersmith and Feldman, I was struck by the simplicity of their argument connecting negative self-concept and low educational performance. Coleman points to Coopersmith and Feldman's recognition that self-esteem is part of performance itself. Children with high self-esteem have a more realistic view of how they will perform. Interventions in the form of enhancing skills and consequent performance should remove one of the antecedents of low self-esteem. Disaffected pupils constantly struggle to

maintain self-esteem through actively constructing the inferiority of others (Gurney, 1988), which is something that I witness every day in school.

#### 2.3.4 Informed Impressions

My impressions were becoming more informed as my reading took seemingly diverse directions, although the texts were all connected in some way. My critical faculties increased as a result of comparing theory with my own practical experience. This was a gradual process but I can identify works that had a greater influence because they resonated with my experience. One of these was Hewett (1968) who, writing about emotionally disturbed children, discusses possible environmental models that impact on the child's mind. The *psychodynamic interpersonal strategy*, with its application to teaching in promoting the role of teacher as educational therapist, appears to be the forerunner of nurture group theory. I was struck by the main tenets of this strategy: that the teacher can only teach what the child is ready to learn and that children get ready for school while they are at school, rather than being prepared for school at home (Hewett, *ibid.*). The child is nurtured from his intellectual and psychological stage of development rather than his chronological age. The child benefits from warm and positive relationships with adults who accept him as an individual.

Consideration of the psychodynamic strategy helped to clarify my perception of my role as educator. I rejected the therapist role, as I did not want to neglect my role as educator at this time (1996) – teaching mathematics had to take priority.

The second model discussed by Hewett is the *sensory-neurological strategy*, which places emphasis on restricting the amount of stimuli and space in the environment, relying on teaching materials to stimulate. It was not an approach to which I could subscribe and my views remain the same today. My reading helped to clarify an essential part of my practice,

which is to provide a variety of stimuli in the classroom. Such counter-evidence confirmed my belief in using the environment (both inside and outside the classroom) to stimulate an interest in mathematics. I am aware of the implications of too much stimulus (in terms of behaviour) but it is the way I manipulate the environment that determines my ability to manage behaviour.

I make a connection here to one of Wheldall and Merrett's five principles of positive teaching (1992), that behaviour is influenced by classroom contexts. Their concern is with ecological classroom variables. Two other principles – that almost all classroom behaviour is learned and that behaviour changes as a result of its consequences – necessitate a strongly behavioural approach to classroom management, such as Mardell School's adherence to Assertive Discipline. The principle that teaching is concerned with the observable implies that there is no need to consider psychological factors in the child's background whilst teaching the child and managing his behaviour.

Adhering to the observable was essentially the only strategy that I employed over my first year at Mardell School. What should have been a positive policy became one that focused on teacher disapproval and reprimands at the expense of the use of praise. Wheldall and Merrett (*ibid.*), in a survey of primary and secondary teachers, found that approval amongst secondary teachers at 55% was higher than disapproval (45%) but negative responses to social behaviour were three times as frequent as positive responses. This position needs to be reversed, as expecting children to behave well without the need for praise is bound to result in behavioural difficulties unless the rule of fear dominates.

Since fear in the relationships between me as teacher and children as pupils has no place in my thesis, I have found support for my views on building a trusting relationship based on mutual liking and respect from other writers. Farrell (1995) issued guidelines for teachers,

one of which is liking and respecting pupils, not an easy task with disruptive pupils (reiterated by Gray and Richer, 1988). These pupils are perceived as challenging the authority of the teacher but are insecure and afraid and project their feelings of frustration, anger, fear and embarrassment onto the teacher, thereby creating stressful situations (Pik, 1987). This analysis resonates with my own and leads to coping strategies based on expediency. The need to seek help with problems is still seen as an admission of failure by the teacher concerned. In these circumstances it is difficult for the teacher to remain calm and in control and consistent in dealing with problem behaviour (two of Farrell's guidelines). Through research into my practice, I have come to realise my own part in the escalation of conflict, where my emotions intervene and where I introject the frustration and anger of the pupil.

Fensham (1986) and the DES report (1989) represent contrasting opinions on the mathematics curriculum for disaffected youngsters. The DES report concludes that the curriculum needs to be work-related in order to be relevant, whereas Fensham finds that children do not see 'maths for life' as relevant to their present world. My own opinion on the relevance of the mathematics curriculum is grounded in my experience and knowledge of my practice. I agree with Fensham that learning about hire-purchase, wages and budgeting is as irrelevant to alienated pupils as a rigorously academic course. The DES report found that children who behave badly "see academic work as competitive and the competition as unwinnable" (p.106) - therefore, to avoid losing the competition they do not enter it. In my experience the answer lies in broadening the base of mathematical experiences offered to students while at the same time working on the acquisition of basic skills.

## 2.4 EMOTIONAL AND BEHAVIOURAL DIFFICULTIES

### 2.4.1 Introduction

The literature on emotional and behavioural difficulties has a more direct bearing on my research and encompasses various approaches to what is acknowledged as a problem for communities such as schools. Taking a behavioural, ecosystemic or psychodynamic approach affects the proposed solution.

### 2.4.2 Behavioural Approach

Behavioural theory dominates the literature on this area of special needs and much has been written on which curricula and techniques will best control and modify behaviour (Sulzer-Azaroff & Mayer, 1977; Mongon & Hart, 1989; Bijou & Baer, 1978). Methods include an emphasis on extrinsic rewards and consequences (Dupont, 1975).

MacMillan and Forness (1975) consider that a perception of behaviour as situation-specific (and not predetermined by unconscious or emotional forces) is a limitation of behaviour modification because it ignores the cognitive aspects of reinforcement, which set up dispositions and beliefs. A reliance on extrinsic motivators deprives the child of the opportunity to depend on internal reinforcers, such as a feeling of satisfaction. In time, one hopes that natural reinforcers (such as social praise) will replace the artificial ones. A strictly behaviourist approach supports systems of behaviour management such as Assertive Discipline. The potential failure of this system results from competition between material rewards and intrinsic motivators like the 'fun' gained from misbehaving. Correspondingly, emotional pressures and stresses external to school can mask appreciation of the consequences of behaviour. This is why other researchers (eg. Cooper,

Smith and Upton, 1994, see p.33 below) advocate a systemic approach so as to take account of the various influences on the child's behaviour. From this perspective, emotional disturbance does not occur within the child exclusively but is a phenomenon of the interaction between child and ecosystem (including family, school, classroom and individuals within the system). (See 2.4.3)

I foresee practical problems with Long's model of 'behavioral science' (1975). She recommends tying the curriculum as closely as possible to the group's developing interests – fit the course to the child (that way the child is more likely to be motivated to follow the course). Unfortunately this assumes an amount of flexibility beyond the National Curriculum. However, I have managed to find means of harnessing children's interests within national objectives for mathematics. For instance, using and applying mathematics has involved projects on motorbikes, cars and sport. In Long's model, learning should be experiential where possible and related to real life. If the teacher presents mathematics as real and, hence, valuable, the message is that the teacher values the child. However, I cannot make the same connection between 'real life' mathematics and acceptance of the child. There are other ways of showing acceptance and, as I argue below (2.6.3), real life mathematics is not necessarily valuable to the child.

Tattum (1982) interprets behaviour from the perspective of 'Symbolic Interactionism'. It is the child's construction of reality that directs his behaviour. For instance, in school students weigh up in which teacher's lessons they can get away with certain behaviours. It is not a reaction 'caused' by internal or external factors, it is a result of the student acting in the light of his own interpretation and construction of reality – "this is the lesson in which I can swear". If this is the source of behaviour, we can change it by manipulating the consequences of behaviour particularly by positive reinforcement. However, I doubt that the child is always cognisant of future consequences, as Tattum states. In my view, the



child can be indifferent to consequences even when they are pointed out to him. It should be noted that the attention given to bad behaviour could in itself be reinforcing. In this perspective, blame is placed squarely on the child. In contrast, when Tattum interviewed students from a detached unit they placed blame on teachers. As they saw it, the most important quality in a teacher was respect for the students.

Wheldall and Merrett (op.cit.) outline the Behavioural Interactionist Perspective (BIP). Its principle of mutuality and reciprocity of behaviour in teacher/learner situations emphasises natural learning experiences with naturally occurring reinforcers, such as teacher praise. Also, if children monitor their own behaviour (by completing a star chart, for instance) their behaviour should improve. In this way BIP differs from the traditional behaviourist position of imposing rewards and punishments. The aim is for children to assume a greater degree of control over their own learning. Teachers can help by increasing their own use of praise and reducing disapproval and reprimands. However, a behaviour management system that draws attention to undesirable behaviour (like AD) employs a high level of both approval and disapproval (often simultaneously). There are also inherent difficulties in children monitoring their own behaviour when they deny or are not aware of such behaviour. Wheldall and Merrett surveyed primary and secondary schools and found that the most troublesome behaviours were talking out of turn and hindering other children. In my experience, it is difficult to come to an agreement (intersubjectivity) on the nature of such behaviour. That is to say, children do not recognise when they are talking out of turn or inhibiting others in their learning.

### 2.4.3 Ecosystemic Approach

The Ecosystemic viewpoint also centres on interactional processes as an explanation of behaviour. Here the interaction is between environmental influences and the internal motivation of individuals. In this socio-ecological perspective, small changes in any part of the ecosystem reverberate throughout the whole system (Cooper and Upton, 1992). For example, changes in home circumstances may affect a child's interpretation of events at school, thereby altering the pattern of interactions within the school. Therefore, emotional disturbance stems partly from within the child and partly from (a discordance in) the relationship between the child and other individuals or groups. Glynn (1986) believes that 'setting events' or ecological conditions exert the same control over human behaviour as contingencies (ie. as the behaviour arises) of reinforcement. One powerful setting event in the classroom is the presence of the teacher, whose interactions can have more effect than physical environmental changes (such as seating arrangements). For example, adults modelling desired target behaviour – enjoying working on mathematics problems – is a powerful form of antecedent control. Paradoxically, this rarely happens due to a concentration on monitoring children's behaviour. Stimulus events may occur at the same time as setting events: for example, presenting the child with a worksheet while a classroom assistant is present. The behaviour of the child then changes in response to the worksheet or the response of the adult to the worksheet. In a positive way this could mean the adult modelling the desired behaviour (how to solve a problem), which is then picked up by the child, as long as the child respects the adult and wishes to please them. It may be enough for the child to like the adult rather than wanting to be like them. The more the adult shows respect for and liking of the child, the more likely the child is to respond in the desired manner.

Cooper et al (op.cit.) clarify the reality of confrontation when they state that pupils and teachers have a rational basis for their behaviour but become locked into a cycle of negativity, making it difficult to separate cause from effect. Teachers become more negative in response to misbehaviour and pupils misbehave in response to the teacher's negativity. In theory, 'reframing' offers a chance to break out of the cycle by giving a more positive interpretation of the situation. The teacher can wrest control by reframing oppositional behaviour, like talking out of turn, as the pupil interrupting to clarify certain points. The pupil may reduce the undesirable behaviour if it is seen as co-operating with the teacher. Thus change in the adult's behaviour can modify the behaviour of the child. Reframing may not be immediately successful as, in my view, it takes a skilful person to execute it without appearing to be making fun of the child.

However, a different kind of reframing can take place in the mind of the teacher. For instance, Wright (2001: 10) has recently written about a nurture group.

“Now we try to ensure that they [EBD pupils] get the attention before they demand it; we see continued 'attention-seeking' as 'attention-needing' ...”

The revelatory nature of this statement comes from the reframing of the behaviour and the repositioning of the pupil in the mind of the teacher as someone who can be given attention as soon as he walks into the classroom. A connection is made to a need in my teaching, of which I was not consciously aware. I am able to see a practical application to my classroom. The quote triggers a translation into my own practice – what do I or can I do like this? In my mind I envisage a technique that I call 'massaging'. Open body language, which shows that I am pleased to see them, together with seemingly innocuous questions (like “How are you?”, “How are you feeling?”, “What's been happening?”),

“What’s the matter?”) have the object of bringing the child into the social sphere of the classroom as well as providing attention. During such multiple questioning, books, etc, are being given out and the classroom is being prepared for the lesson so that, by the time the questioning has finished, the pupils are ready to learn with a starter that grabs their attention.

The reverse side of this approach is that a teacher should never ignore a child with EBD because to do so brings two consequences: it confirms the child’s picture of adults as uncaring and it is likely to increase the problem behaviour as the child continues to ‘need’ attention. From the child’s inner world, his interpretation of his circumstances shapes his reaction to others both at home and at school. Basically, adults are untrustworthy and unreliable and, therefore, teacher behaviour can be confirmatory.

Here I have outlined what I have learnt through having my values clarified by another writer. I came to know what my values were by reading and reflecting. I recognised them as written by my own hand or by another’s.

#### **2.4.4 Psychodynamic Approach**

Emotional and behavioural difficulties can be seen as the result of the child failing to negotiate the intra-psychoic and external conflicts associated with the processes of maturity. In this case the most appropriate intervention is therapeutic, based on the work of Anna Freud and Melanie Klein (Mongon and Hart, 1989). The child has difficulty acknowledging the good and bad within himself, attributing blame to others (‘splitting’). In order to develop, the child must give up some control to become dependent and experience trust in a relationship with an adult.

Trust is one of the themes arising from my research (Chapter 5). However, dependency may be associated with abuse or rejection. If a mother is unable to be emotionally available for her child, attention-seeking behaviour increases only to produce further rejection from the mother (Greenhalgh, 1994). Thus it is important for the teacher to be emotionally available in order to compensate for this deficiency. Greenhalgh's concept of *emotional holding* proved to be important in retrospect as a tool for comparison with my own emerging constructs. At first, I did not believe that my role included emotional holding. Greenhalgh defines the adult's role in this respect as demonstrating that distressing feelings can be tolerated and the child can be helped to manage such feelings and understand their meaning. I saw this as the role of a therapist or counsellor, which required removing the child from the classroom. My responsibility was to teach mathematics and to administer the behavioural management system. This meant responding to difficult behaviours on a content level rather than a relationship level. This part of Greenhalgh's text resonated strongly with my early experiences of teaching children with EBD. Focussing on content can escalate a conflict to the point where a child gives up out of frustration or anger, resulting in more severe behaviour. The adult who can contain the initial behaviour with an empathic response, encouraging the child to reflect on his problems, strengthens the child's ego and enables him to learn to contain the behaviour himself. The kind of relationship necessary to achieve this level of success takes time to develop and the discipline to remain non-judgemental and positive in the face of extremely negative behaviour.

A shift has occurred (through the experience of teaching) in my perception of my teaching role to include the use of empathy and 'being there' for the student. This has manifested itself in one way as possessiveness towards students in my class, a feeling that I have to defend *my* students against unjust treatment by others: for example, in appealing for an improved level for a Year 9 student in his SAT exam.

Reading on empathy has enabled me to clarify what the term means to me. Barnett (1987)

offers two definitions:

- The cognitive ability to recognise and understand thoughts, perspectives and feelings of others.
- To experience an emotion congruent to an emotion of another.

Either definition results from affective cues transmitted by another or from one's knowledge of another's state. I call this *surface level* or *emotional empathy*, where an emotional response is triggered by the emotions of another and is essentially somatic. The implication of such a belief is that it makes it more difficult to teach empathy to a child. However, the cognitive processes of empathy *can* be taught, possibly through cognitive role-taking. Empathy can be taught through the teacher's relationship with the child.

Strayer (1987) defined empathy as the self's feeling into (Einfühlung) the affect of another person. She states that children with maladjustment (sic) are poorer in judging the emotions of others and in empathic response. A shared affective response is the main criterion for empathy. For me, Einfühlung implies much more than an emotional response, because cognition is involved, when the teacher deliberately places herself in a position of *being there* alongside the child. Complete knowledge and understanding are only there if the teacher has experienced the same emotion in the same context, which would be rare. However, it is possible for the teacher to place herself alongside the child so that understanding develops from their relationship.

It is important to build a trusting relationship with an adult otherwise the child becomes destructive, believing that all adults are untrustworthy. Salzberger-Wittenberg, Henry and Osborne (1983) warn that feelings experienced in the past can be transferred into present relationships with teachers, who are blamed for the unsatisfactory world in which the child lives. The child needs an adult who is able to help him control his negative desires (another

example of emotional holding). The child needs a reliable adult who will not submit to enacting the script of the child's internal play and not conform to his expectations about untrustworthy and unreliable adults. They (possibly his parents) form part of his internal world and the relationship between self and others, which is transferred into the new situation. His picture of the world influences the way the child behaves – he may expect to be punished and, therefore, behave badly until the teacher does punish him. However, if the teacher can show that she understands the child's emotional pain then it should be easier for him to bear.

Wilson and Evans (1980) found that staff members who are accessible to children would have greater success. Resilience and warmth, together with heightened sensitivity and insight, are the qualities required of successful practitioners. From their study, the most successful teachers were those who expressed feelings of anger or dislike of unacceptable behaviour without becoming punitive or retaliative. At the time of reading these findings I was teaching at Mardell School and noted that we punished quite frequently (with detentions) and questioned whether we could give a contradictory message at the same time by remaining warm and understanding. Of course this is not Wilson and Evans' message - one needs to reduce punishment for a benevolent approach to produce more acceptable behaviour. They found that the most powerful incentives were praise and approval and the most effective disincentives were the displeasure and disapproval of adults whose opinions the children valued. Therefore, it is important for the adult to build a relationship with the child.

Also, at this time I was developing a predilection for flexibility and found confirmation in Wilson and Evans' finding that effective "schools do not adopt rigid systems of reward and deterrence." (ibid: 86) They structure their approach on an individual basis, taking the emotional status of the child into account. This is an argument against the traditional

approach to the mathematics curriculum. Textbooks used contained topics relating to situations that pupils were likely to encounter in real life. Perhaps pupils do tend to judge schoolwork by its practical usefulness. However, they can also appreciate mathematics for its own sake, as when using trial and improvement methods to find solutions to equations.

A troubled child in a new situation may be anxious, especially if he does not have a history of successful learning experiences. According to Gestalt theory the child does not experience the 'creative adjustment' which occurs when a person has dealt successfully with difficulties arising from a new situation (Clarke, 1988). Part of the therapy is to go to where the child is, acknowledging his worries so that he is free to come to an understanding of a new mathematical concept, thereby making it his own. Now the child can relax, having added another completed 'gestalt' to his personality. In this context, 'gestalt' means an entire area of understanding about mathematics. This brings me back to Winnicott's transitional object (see p.22): locating and using a metaphorical transitional object for a child who has not completed the transition away from mother may help the child's development.



### 2.4.5 Weil-Kayley – Victoire Sur Les Maths

Weil-Kayley (1985) documented her therapeutic work in a Paris clinic for children with learning difficulties. On reading her theories and case studies I sought comparisons with my own experience as a mathematics teacher of one year at Mardell School. At that time I found similarities with the ecosystemic approach (2.4.3) which takes into account factors in the wider ecosystem: most importantly, the family. I contrasted this with my approach of treating each child equally in ignorance of his home situation. Formal educational goals were of primary importance to me in contrast to the psychodynamic interpersonal strategy described by Hewett (2.3.4).

In Weil-Kayley's interpretation, mathematics is a mysterious language for pupils but has connections to their own experiences. For example, subtraction is synonymous with loss, division with splitting up. I posit that aversion to certain operations must (at least in part) stem from early experience of failure or lack of understanding – pupils may not wish to relive a bad experience. Weil-Kayley proposed to heal emotional wounds through the symbols of mathematics.

“Connaitre la signification des symboles et saviour les utiliser dissipe une grande part du mystere...” (Weil-Kayley, *ibid*: 52)

(“Knowing the meaning of symbols and how to use them dispels a large part of the mystery...”) She aims to help the development of the child through mathematics, a goal that I also try to attain. For Weil-Kayley a link can be made between the relations of mathematics and the relationships of family life. Children who feel they do not belong have problems grouping elements. The students I teach make their own allusions to

everyday life. I may say to the class, "We are going to look at the relationship between..." provoking the response, "Why, are they married?" According to Weil-Kayley, the students make a connection to the relationships in their own lives. However, children can learn that in life, as in mathematics, they can find a solution.

#### 2.4.6 Classroom Practice

The most influential work that I have read on the subject of classroom practice with children with EBD is by Cambone (1994). He identified a gap in the literature on actual classroom practices used with these children. This confirmed my own conclusion about the extent of the literature in this area, particularly regarding mathematics. In Cambone's view, the literature is dominated by behavioural theory with academic learning playing a secondary role. He warns that a behavioural system can become a 'curriculum of control' in itself (as I found in Mardell School). Students should be encouraged to learn higher order thinking skills rather than follow a diluted curriculum.

Cambone undertook his research during 1988-1990 at a residential treatment centre (in USA) with 'Anne,' a teacher of five boys between the ages of five and eight. Cambone's aim is to categorise and classify the curriculum and pedagogy that Anne shaped for these boys. As he begins to outline Anne's practice, possibilities are opened up for me in a way that I had not considered before. That is how this particular reading advanced my practice. For example, when a boy is having difficulties, Anne looks to the source of the problem in the ecology of the class, ie. group interactions, class schedule, order of activities and the timing and quality of her own interventions. She then rearranges the classroom ecology accordingly, helping to shape order in the class instead of focusing on managing individual behaviour (through punishment, for example). Cambone recognises this as a 'paradigm shift'; (mis)behaviour is seen as a teaching/learning opportunity. The behavioural

difficulties arising from her pedagogy of concrete, direct experience, manipulation of objects, games, traditional drill and spiralling activities (progression) provide an opportunity to teach the boys the skills they need to remain safe and controlled in the face of real learning challenges.

Cambone characterises Anne's approach as 'highly improvisational teaching', which is one of the themes that I identify later (5.2.7 Flexibility). Mathematically (for Anne), this takes the form of thematic teaching – one theme per month, for example, geometry, estimation, money – but with an emphasis on conceptual understanding rather than purely algorithmic mathematics.

#### **2.4.7 Summary**

Three broad approaches to the 'treatment' of pupils with emotional and behavioural difficulties have been set out above. In the behavioural approach, the child constructs his own reality and can be manipulated by the consequences of particular behaviours, being motivated by extrinsic rewards only. On the one hand the child is seen as a thinking, feeling being capable of directing his own behaviour, and on the other, almost as a blank sheet able to learn socially acceptable behaviour through appropriate feedback. In practice, I have found that children with emotional difficulties are not so easily manipulated. In fact, they are skilled at manipulating adults and situations to their advantage and only the most consistent and intensively applied behavioural approach will have any effect. In a classroom the child's senses are bombarded by numerous influences, which makes choosing behaviour a complex business. The teacher needs a collection of behaviours from which to choose under pressure. Various stimuli compete for the child's attention so the rewards offered by the teacher have to be more attractive than those offered by peers.

In the ecosystemic approach, greater emphasis is placed on the various external influences on the child and the way that they change the whole pattern of interactions. In this way the focus is on the child's place in the ecosystem. This contrasts with the psychodynamic approach, in that the latter attempts to analyse the emotional needs of the child and apply a therapeutic solution.

In reality, a mixture of the three approaches informs the practice of the schools in which I have worked. Modifying behaviour is a common outcome. When I joined Mardell School it had a strictly behavioural system and, over time, brought in elements of an ecosystemic approach, involving families and outside agencies to agree a consistent policy towards individual children. More opportunities for counselling were provided but the basic emphasis on the child as an autonomous thinking being never changed – his behaviour is his choice.

At Breesdale School, the lack of a consistently applied (and supported) behavioural policy meant that no particular approach informed the management of behaviour, except that it was basically punitive, based as it was on an escalating programme of detentions. At Canfield School, the members of staff work with the children to underpin the behavioural policy with a therapeutic approach whilst maintaining flexibility according to the emotional status of each individual.

My own theoretical perspective has grown through looking at these three perspectives, in that I have been able to analyse the context of my practice with more critical acumen. I have used the body of knowledge on behaviour to develop my thesis, in that I have been able to compare my own emerging theories with this knowledge.

However, I could not develop a theoretical perspective by reading solely about theory; it is reading on practice (or reading on theory arising from practice) that provides the impetus for movement in my development in one direction. I found it more effective, as part of my learning process, to compare the practice of others (in the field of emotional and behavioural difficulties) with my own practice (in an area new to me) than to try to apply theory, in particular behavioural theory, to my practical experience.

## **2.5 REFLECTIVE PRACTICE**

### **2.5.1 Journal Writing**

I needed a vehicle for recording my personal growth through my experiences. I began my diary as a forum for reflection.

In this section I shall review the literature on keeping a journal and examine how it has helped me in my own diarising.

Green (1993) describes journal writing as an aid to thinking and understanding, not just from the researcher's point of view but also from that of the other participants, who can be invited to arrive at a shared meaning of events. I have presented transcripts and video footage to participants and discussed extracts from pupils' diaries with them in order to elicit their sense of what is going on (see 3.8.3).

Reflecting on one's own practice raises self-awareness and creates knowledge through the specific process of reflection in the moment advocated by Schön (Eraut, 1995). The teacher reflects while teaching (in the action), thinking critically about the thinking that led to a particular action or problem. Out of this comes new ways of framing problems which

can yield new discoveries and lead to a further cycle of reflection-in-action. I have found difficulties in implementing reflection-in-action as much of my teaching is instinctive; I have found it easier to reflect-on-action shortly after the incident because I then have distance from my emotions. For example, watching a videotape later on the day of recording, I am able to reflect on one student's possible motivations and how my initial interpretation 'in the moment' masks the consideration of other interpretations.

McNiff (1988) believes that self-reflective enquiry can lead to teachers developing personal theories of education from their own classroom practice. I agree that it is easier now – after a long period of reflection – to identify my own personal approach to teaching mathematics. As an aim of action research, enquiry becomes not only a way of understanding practice but also becomes part of the practice itself. When a problem is identified, it sets in motion a spiral of planning a solution, action (implementing the solution), evaluation and reflection and a revision or extension of the plan.

Reflection need not be the prerogative of the teacher; by writing a journal students have an opportunity to express, and reflect on, their feelings about mathematics. Borasi and Rose (1996) found that journal writing had a therapeutic effect on the emotional components of learning; by revealing their anxieties the journals prompted teachers to help students overcome their difficulties. Teachers read and commented on the students' journals, thus making the journal a medium for reflective dialogue. The ability of students to learn from their own journals requires a certain level of literacy on the part of the student. Students with special educational needs may benefit from taping their thoughts and feelings but, in practice, I have found that students with EBD find it difficult to separate their feelings about mathematics from their feelings about peer relationships in the classroom (3.8.3). This works against the development of a fruitful dialogue that could move both teacher and student forward in their understanding of attitudes towards mathematics.

## 2.5.2 Critical Inquiry

The essence of being critical lies, I believe, in my ability to identify ‘living contradictions’ where my values are not being lived fully in my practice (McNiff, Lomax and Whitehead, 1996). It may be that external constraints (school policy, inspections, national curriculum) contribute to the existence of contradictions. Also, a lack of awareness of what my values are hinders criticality but, correspondingly, values can be revealed through repeated reflection.

Critical incidents stand as evidence for the criteria by which I wish to be judged as effective. Extracting these from the data – eg. evidence of empathy – provides an indication of performance or success. The more I employ empathy in teaching, the more I wish to use it as a criterion for success. This criterion has been reached through analysis and meta-analysis of data, in which I have uncovered the value of empathy to my teaching.

### (3.6.3 Critical incidents)

According to Tripp’s (1993) definition, critical incidents are those events that can be interpreted as significant. The incident may be typical of unstated procedural rules (stating objectives at the beginning of the lesson) but will become critical through further analysis. However, I have learnt to identify critical incidents as those having a particular emotional significance, which is my interpretation of ‘critical’ and helps me to understand the emotional difficulties of the students and my own emotional reaction. I identify ‘emotional significance’ by the demonstration of emotion during a particular incident and the extent to which my own emotions are aroused. Following Tripp’s model for creating a critical incident, I make initial meaning of the incident then find a more general meaning, which highlights the significance of the event. An action research cycle may then be put in motion if improvements are required.

By reflecting on more general issues, I was prompted to ask questions such as, “What are the values that I teach through my teaching and what do I write most about in the diary?” (see 3.6.1). Thus, I was able to criticise my own diarising for not including the child’s response to my interpretation and for not examining different hypotheses for the child’s behaviour. This had the effect of moving the research forward because I then used the diary as a more interpretive tool.

### 2.5.3 Summary

The literature on keeping a journal helped me with my diarising by raising the possibility of writing for an audience (not just for myself). I could share my reflections with others and open them up for wider interpretation. It is important, for the purpose of moving the research forward, for me to be aware of other interpretations, particularly the students’. There is a place for student diaries (whether handwritten or tape-recorded) in providing an opportunity for reflection, although guidance from the teacher-researcher is required.

Focusing on the *emotional significance* of an event helps me to understand the place of my own emotions in the incident (see 2.7.3). I am interpreting the event’s emotional significance and, therefore, my emotions are bound into the event by my interpretation.



## 2.6 MATHEMATICS AND EBD

### 2.6.1 Pupil Needs

Having examined the literature on EBD, mainly outside the context of mathematics, I shall now focus on the needs of pupils with EBD in regard to mathematics.

When evaluating different practices of mathematics teaching - some proposed specifically for 'troubled' children, others are general theories - it helps to keep in mind the question: "What do I consider to be the best practice (for me) to meet the needs of pupils with emotional and behavioural difficulties – and why?" I am searching for a link between practice and needs. I consider that the needs of children with EBD can be met by trusting relationships with adults in the safe environment of a small classroom with particular attention paid to social cohesion. Mathematically their needs are no different from those of other children but where learning difficulties hinder accessibility to the curriculum, additional support is needed in order to gain access. As long as there is colour and variety in the way mathematics is presented then the children's experiences will be rich.

### 2.6.2 Constructivism

Lerman (1994) states that adopting the philosophical position of Constructivism means accepting that knowledge exists only in the mind of the individual who has constructed a personal reality based on past experiences: a reality modified by interactions with the environment.

According to the socio-ecological view, discussed by Mongon and Hart (op.cit.) the construction of knowledge is seen as a social (largely collective) process (see 5.2.10).

Behaviour is created by the reciprocal relationship between the environment and the child. Taking teacher and pupil as an example focuses analysis on the discursive practices (domains of social interaction) in the classroom. Jaworski (1994) elucidates the teacher's function to use language as a tool to aid the pupil's construction rather than using it to transmit knowledge to the pupil. Talking and reasoning about mathematical ideas are central to learning. An investigative approach to teaching and learning mathematics thus becomes the natural focus of the classroom, where pupils try to make sense of new pieces of mathematics by fitting them into their own models of mathematics (Jaworski, 1995).

First, how did I engage with Jaworski's writing on the investigative approach to teaching and learning mathematics? I brought to the reading my own experiences of teaching investigations at GCSE level: therefore, what I found was something different from my experiences. In that sense, I approached the text from a different angle from that intended by Jaworski. I recognised the importance of using language in the classroom to aid the students' construction of their reality in relation to mathematical concepts rather than solely to transmit knowledge. I believe that I involve students in their own learning by encouraging them to think mathematically.

I concluded that reading about constructivism had revealed two related values: the use of language in the mathematics classroom needs attending to and it is important for students to think mathematically. Through GCSE coursework, students learn that investigations mean looking at mathematics in an abstract way, usually by building patterns and finding rules. If they can make sense of this activity and fit it into their experience, it is a type of experience that is classroom-based (not based on their experiences out of the classroom). The knowledge that has been constructed is *their* knowledge because they have made sense of it internally. In this way, knowledge is different for every student – one may only be able to use deductive reasoning, while another will use inductive processes. Yet

another student will have completed the activity without making sense of it and, therefore, it does not become part of his experience.

However, talking and reasoning is not the prerogative of the investigative approach. The teacher can help by gaining an insight into the child's way of thinking by providing opportunities for pupils to talk and openly negotiate meanings (Jaworski, 1988) - in this way mathematics is brought into being. The aim is to generate understanding rather than simply teaching algorithms, for example.

Constructivism itself is not a practice but a perspective through which mathematics can be taught via the medium of investigation, according to Jaworski. Socially constructed intersubjectivities replace the notion of objective reality. On the part of the pupils there is a shift away from trying to find out what the teacher wants, towards constructing stories that make meaning of the mathematics to be shared with the group. In my practice, when pupils ask for reassurance that they are 'right', I remain silent while they convince themselves and others that they must be right (or are convinced by others of their error - see diary extract 4.2.3). If they become confused, I draw out the thread of their argument so that they can re-examine its logic.

### **2.6.3 Real Mathematics**

Howson and Wilson (1986) distinguish between the intended (national) curriculum, the implemented curriculum (what teachers teach) and the attained curriculum (what students learn). This requires different foci for research centred on teachers' theories and students' perceptions, attitudes and motivations. They criticise curriculum research for not developing theories for practice that can be translated into 'tangibles' in the classroom.

'Real mathematics' tends to mean 'real life' problems designed to motivate pupils. School mathematics at present provides contextual rather than realistic problems.

The learner's experience is regarded as separate from the learning process. Linking mathematics to everyday experience is seen as more motivating for learners. Lave (1992) defines the process of 'mathematizing' everyday experience as a type of situated learning, which must engage the imagination to be successful. Real mathematics is a limited concept as it is still situated in the classroom. In my experience, when children make up their own word problems an element of fantasy creeps in. The fantastical nature of mathematics can be harnessed to motivate children and teach mathematical concepts. Mathematics does not have to be realistic to be motivating. Investigations like, "If we were to fill this classroom with water, how much water would it hold?" achieve these goals without being particularly 'everyday', although part of this investigation involves measuring the classroom, which is something real.

In examining what motivates learners, particularly 'low attainers', Trickett and Sulke (1988) believe that breaking down a task into small steps only obscures its purpose so that pupils do not get an overview or a sense of relationships. Also, smoothing out difficulties for low attainers (by making sure that answers are whole numbers, for instance) does not advantage them in the long run. Practising techniques before applying them to problem-solving lacks purpose for students because of the delay involved in the application of the techniques. Teaching a method while solving a problem is more conducive to learning and provides a link between the intended and the attained curriculum.

An affective component is always present in teaching and learning interactions in the form of students' motivation but according to Wilson (1994) few have written about the motivation of teachers. In all probability few teachers are aware of the sources for their own motivations during the many interactive processes that take place in the micro-

mathematical community of the classroom. Wilson advises teachers to make a choice in the moment either to share their feelings with students or to recognise those feelings but choose to hide them. The danger of the former is that the student may feel responsible for the feelings of the teacher. Constraining or revealing emotions in a controlled way, particularly in a stressful situation, has parallels with emotional holding. Teachers under stress are liable to express emotions involuntarily unless they are aware of the students' motivations and understand the cause of their emotional difficulties. It was at this point that I decided to read more deeply on the nature of emotion, which was an important route towards understanding my own motivations.

#### **2.6.4 Summary**

At the beginning of this section on mathematics and EBD I posed the question, "What do I consider to be the best practice to meet the needs of pupils with emotional and behavioural difficulties – and why?" It is not possible in this brief survey to answer the question definitively – in fact that is the task of this thesis. At this juncture, I can summarise constructivism as a discourse for informing choices that does not exclude the possibility of mathematizing and need not exclude action research in the classroom if the aim is to centre theory and practice on the child. Taking the child's experiences and ideas as a starting point and encouraging discussion and expression, all members of this community will contribute to the construction of knowledge. There is no need to censor or sanitise mathematics for a child with emotional and behavioural difficulties who can cope with the frustrations and struggles inherent in mathematical challenge, so long as this takes place in a supportive environment where everyone understands the purpose of the activity.

It is important to take account of motivation in the experience of learning - both the teacher and the student's. Various styles and methods of teaching affect the student's ability to

learn but it is the interaction between the motivations of the teacher and the student that determines the quality of learning.

## **2.7 EMOTION THEORY**

### **2.7.1 Introduction**

The nature of emotion and the relationship between emotion and cognition are the elements of the wider literature on emotion that pertained to my research. I chose these areas because the influence of emotion on behaviour is crucial to an understanding of children with EBD.

Ekman and Davidson (1994) discuss the extent to which we can control our emotions. They first distinguish emotion and mood by function – emotion modulates action whereas mood modulates cognition. Emotions are brief, following sudden but recognisable antecedent events. Moods last longer with slower antecedents. I can accept a distinction between emotion and mood but, in my experience, emotions do not always have recognisable antecedents, even for the emoting subject. What appears to be the trigger event is not always the cause of the emotion.

Linked to the control of emotion is a debate about whether emotions can be unconscious or not. If the cognising subject is not aware of the emotion, can it be said to exist as an ‘emotion’? The answer to this question depends on where one stands in relation to emotion and cognition.

### 2.7.2 Lazarus and Cognitive-Motivational-Relational Theory

Whilst reading on the subject of emotion, I discovered ‘Emotion and Adaptation’ by Lazarus (1991) – the culmination of thirty years work – presented as a definitive cognitive theory of emotion. I shall examine the theory in detail as it had a significant influence on the analysis of my motivations. However, the application to teaching is my own.

Lazarus talks about being in an ‘emotion state’ that is not static; it is a continually changing yet brief reaction to particular circumstances. This can lead to an ‘emotion trait’, which is the tendency of an emotion state to recur. Using anger as an example, the emotion state might be “I feel frustrated”, expressed as the emotion trait “When I get frustrated I feel like hitting someone”. Lazarus distinguishes these two from sentiment, which is a disposition to respond negatively or positively towards a given person or event. (I want the youngsters whom I teach to be positively disposed towards my mathematics and me.)

#### Cognition, Motivation, Relation

To split the theory into its three component parts (cognition, motivation and relation) is artificial, as they do not necessarily exist separately; however, doing so helps to understand how the emotion is interpreted.

#### **Cognition**

*Appraisal* is a central concept – an individual evaluates the situation in respect of its goal relevance and goal congruence. This cognitive activity produces an emotional response (Figure 2.7.2). Continuing with anger as an example, if a personal goal is at stake and the

situation is unlikely to lead to the attainment of that goal then the emotional response will be anger if one's self-esteem is threatened.

### **Motivation**

Appraisal is linked to motivation; what significance has this event for my personal goals and beliefs – is it harmful or beneficial? This results in a coping process that alters the person-environment relationship to produce an emotion. Blame, directed either internally or externally, is crucial for anger where someone is held accountable for their harmful actions, which they could have controlled. The student who throws an object across the room disrupts the existing relationship between the teacher and the environment (the lesson). The teacher blames the student, angry that her personal goal of maintaining order and respect is threatened. She then takes action against the student. The conjunction of particular personality traits (eg. goals) and environmental traits (eg. last lesson on a Friday) has altered the person-environment relationship.

### **Core Relational Theme**

Each emotion has its core relational theme, which is the central relational harm or benefit. For example, in the case of anger it is “a demeaning offense against me and mine” (Lazarus, op.cit.,P.122). The individual must have a stake in the outcome of an encounter for emotion to be generated.



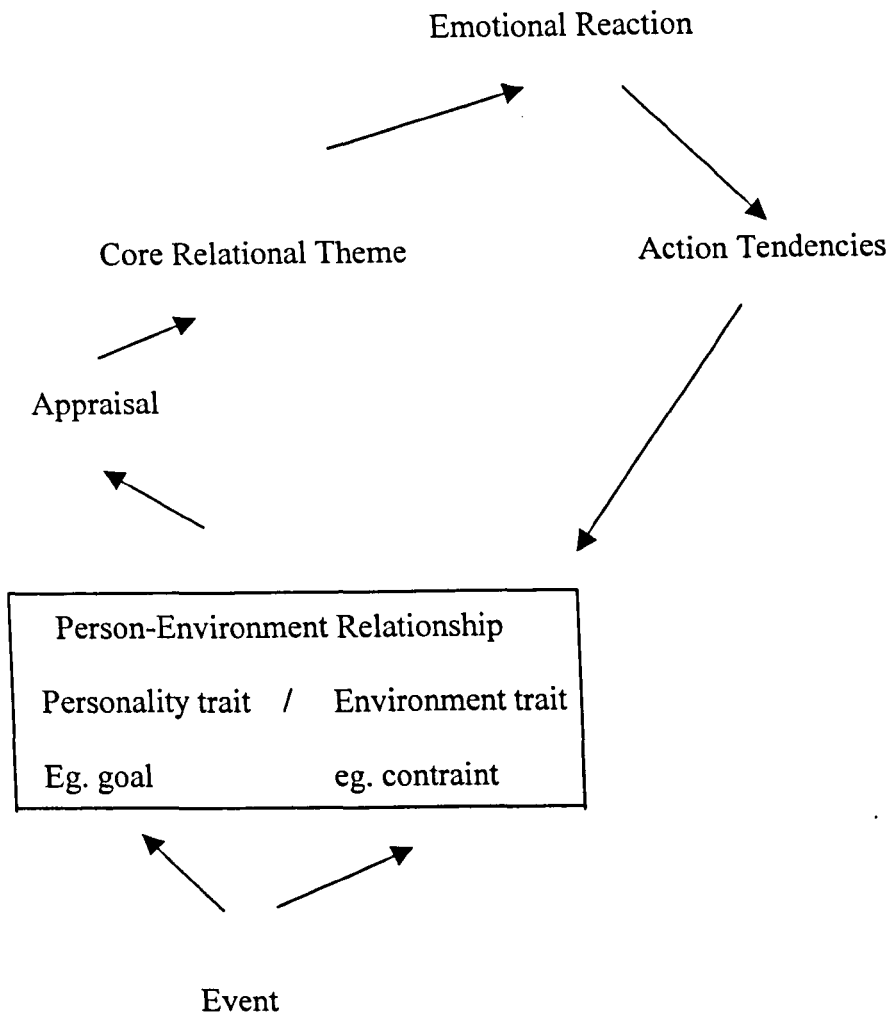


Figure 2.7.2 The Generation of Emotion

### 2.7.3 Application

I found many situations during my year at Breesdale School where I constructed through appraisal the meaning of the person-environment as a threatening one and recognised my motivation to change it because my self-esteem was being attacked. According to Lazarus, anxiety is produced because the type of ego-involvement is the protection of ego-identity against existential threats. I noted that certain actions or action tendencies follow: I shout, punish or emphasise the work and try to teach – all forms of attack with the aim of regaining

control and preserving self-esteem. When this fails flight is the remaining option – I want to walk out but stay and withdraw instead.

Taking an overview of my practice at this time, I see a teacher struggling with negative emotions attempting to cope with children who are also under stress. Undesirable behaviour is often underpinned by anger, sadness, shame or envy, which leads to resentment and rejection of what is being offered by the teacher. The child indulges in ‘problem-focused coping’ (Bowers, 1996) such as fighting and damaging property. I found that Lazarus’ emotion theory helped to understand the processes at work in my classroom. In general, theory helps to focus on the process of reflection and is an aid to understanding. Relationships are the key; my practice develops through the changing relationships in the classroom. Lazarus’ theory has raised my self-awareness and helped me to reflect on everyday interactions. It has helped me to question the norms of my practice, thus informing and advancing my practice (see 3.5.3).

In response to Lazarus’ theory, I present (in the following sections) the arguments of two writers on emotion; one in support of Lazarus and the second against Lazarus.

#### **2.7.4 Frijda**

Frijda (1986) defines emotions as changes in action readiness. Concerns underlie emotions and stimuli elicit emotions when they are relevant to concerns. His theory is similar to Lazarus’ in that there is a period of appraisal (‘comparator’) when faced with the stimulus event, followed by ‘diagnoser’ when the possibility of coping is assessed. The ‘evaluator’ stage is when the seriousness of the event is assessed. For Lazarus, these three stages are covered by the term ‘appraisal’. Frijda’s next stage – ‘action proposer’ – is similar to Lazarus’ action tendency. This action readiness determines physiological changes and the

action selected. Therefore, emotion is a change in relational action tendency. In other words, the action is related to the meaning invested in the stimulus event through the process of appraisal – similar to Lazarus' core relational theme.

### 2.7.5 Zajonc

In contrast to Lazarus, Zajonc (1984, Power and Dalglish, 1997) separates emotion and cognition. Initially, the *affective* tone of the stimulus is assessed as positive or negative and then the cognitive process follows. Cognitive processes can be unconscious.

As I attempted to make sense of the distinction between Zajonc and Lazarus, I recalled a powerful image from my past experience – the historic “famine of biblical proportions” in Ethiopia in 1983.

According to Zajonc, on first seeing the images of babies dying, my senses immediately register shock before any cognitive processes have begun. Then comes disbelief, which requires cognition (memory) leading to sadness and compassion. Compassion is defined as being moved by another's suffering and wanting to help.

According to Lazarus, during the process of primary appraisal the encounter with the stimulus is evaluated as ‘stressful’ because there exists ‘threat’ or ‘loss’. The images of death are i) relevant to the individual's well-being (ie. goal relevant), ii) goal-incongruent as they will block the achievement of the individual's well-being and iii) pertinent to moral values (ego-involvement). Perhaps for Lazarus, everything I feel is compassion from the initial shock, which could be defined as ‘being moved’ by the suffering. ‘Threat’ or ‘loss’ is not clear. Sadness is defined as “having experienced an irrevocable loss” – is it a loss of ignorance or innocence? During the process of secondary appraisal, I evaluate my coping

resources in order to reduce stress. I could switch off the television, share my feelings with others or decide to raise money to help.

Returning to the question of, “Which came first, cognition or emotion?”, if there were cognition before the original shock, what form does it take? According to Lazarus’ theory, the very experience of being shocked means that appraisal must have taken place. I can test this assertion by asking myself why I was shocked. It seems likely that my distress at the sight of a dying baby is linked to feelings about my own children. Here, a cognitive element is apparent because, in my interaction with the environment, it is my memory that causes the emotional reaction. I *know* that I have never witnessed so much suffering; I *know* that I always identify with mothers and babies. However, I am not consciously aware that what I am about to see will shock me. Therefore, it seems as though the feeling has come from nowhere.

“If the personal meaning...vanishes, so does the emotion.”

(Lazarus, op.cit: 9)

### 2.7.6 Summary

If cognition and emotion are inseparable then Daniels’ comment takes on new relevance, with emotion driving cognition.

“Children do not think in the absence of how they feel.” (Daniels, 2001: 113)

In order to connect with how children think, connect with how they feel. Following this logic, in order to advance a child’s thinking processes I need to connect with his emotions, through empathy (see 3.3.4, Diary extract, ‘Tanya’).

Does it matter whether cognition comes before emotion? I believe it does because it adds another layer to the problem of identifying what a child thinks about the way he feels. Take the example of a child anxious about subtraction. The word itself triggers feelings of anxiety, which are integral parts of the child's knowledge base. The child may not consciously 'know' why subtraction and anxiety co-exist but he has learnt to make this association. Cognition and emotion work together to express the anxiety he feels. The coping strategy that he employs depends on the extent of the threat he deduces from the situation. The coping strategy may be one of refusal to work. Empathising with his feelings enables me to help the child verbalise his distress and think about what he knows of his past experiences with subtraction that led to his present anxiety. This is why it is important for me as a teacher to consider how the processes of cognition and emotion interact.

## **2.8 CONCLUSION**

My intention in this chapter was to demonstrate the effect of my reading of the literature on my practice. I have reviewed various theoretical positions on the teaching of mathematics and the teaching of children with EBD. This has enabled and prompted me to develop my own theoretical perspective in relation to others in the field. I have attempted to synthesise the two by outlining approaches to motivating the learner. Lastly, I have reviewed the literature that helped me to understand my own motivations as well as the motivations of the student.

My interpretation of the theories discussed (combined with my experiences) has led me to conclude that an approach that places too much emphasis on the behavioural at the expense of the emotional is likely to fail to achieve any progress in the emotional development of the child.

I realise that this places the emotional development of the child in a more central position in regard to the aims of my teaching, which represents a significant shift from my framing of my original role as focusing primarily on mathematics. This did not happen solely as a result of my reading but as a process of co-emergence of my theoretical and practical position, supported by my research and reading (illustrated by Figure 2.8). This will become clearer on reading (in later chapters) how my practice developed.

The literature that I have outlined as most significant is that which challenged and informed my practice. As a result, my practice has been advanced by my reflections on this literature.

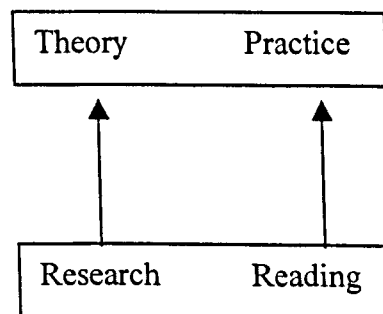


Figure 2.8 Co-emergence of Theory and Practice

At the same time, I reached the conclusion that concentrating on emotional development in a therapeutic environment fails to improve behaviour in the short term without the existence of a trusting relationship between adult and child, which takes time to establish. The key phrase here is ‘trusting relationship’ – without trust there is no basis for either emotional or mathematical development. One commonality between children with emotional and behavioural difficulties is their lack of trust in adults, based on their early and current experiences. Youngsters must be presented with a new set of experiences to

counter the old. Through those experiences they learn to value their relationship with the adult, the adult's belief in their ability to *do* mathematics and their own success regarding mathematics.

However, the class shares the adult's trust. This approach does require a degree of interdependency between members of a group for learning to take place. This will present a difficulty for such children as they lack the social skills to make this work. However, group learning acts as a vehicle for developing social skills as well as mathematical concepts and, therefore, has to be part of my practice as socialisation is one of the aims of educating children with EBD.

Whichever approach (behavioural, therapeutic, etc.) is taken will mean a lot of hard work for all those involved before results can be seen. Progress tends to follow peaks and troughs rather than a smooth upward curve. My own preference, based on the preceding theoretical perspective, is for an inversion in perceptions of and attitudes towards children with emotional and behavioural difficulties, for example, regarding children as attention-needing rather than attention-seeking.

In the following chapter, I integrate the most significant of my readings with the story of my emerging practice.

## CHAPTER 3: METHOD AND METHODOLOGY

### 3.1 THE FRAMING OF A METHODOLOGY

#### 3.1.1 Introduction

My intention in this chapter is to examine the emergence over the period of the research of a methodological framework for the way in which I conduct research. At any given time, from the position of my existing beliefs, I choose to research and/or teach mathematics in a certain way.

I wanted to enquire into and develop my practice, to become a more effective mathematics teacher for children with emotional and behavioural difficulties. I knew which methods to employ; sensitising myself more and more to the children's experiences by keeping a research diary, conducting interviews, taping (audio and video) some lessons and by some third party observations. Keeping a diary was extended to asking some of the children to make comments about their feelings after a lesson. My diary provided the base-line data and, in addition, forms of triangulation reminded me that in every situation there are multiple perspectives.

Regular audiotaping of interviews and lessons took place and some lessons were videotaped. My main interest in viewing and re-viewing the tapes is how I respond to situations and how I work with the children, which is not always visible as overt, identifiable behaviour.



School	Date	Method
Mardell School	Apr. 1996	Start research diary
	Sept. 1996-July 1997	Videotape lessons Triangulation Interview 9H
	Jan. 1998-July 1998	Continue diary – analyse for conditions or themes
Breesdale School	Sept. 1998-July 1999	Continue diary Action research Videotape lessons Start pupil diaries Self audio-taping by 2 pupils Interview Graham
Canfield School	Sept. 1999-July 2002	Continue diary Tape and transcribe parts of lessons

Figure 3.1 Timetable of Research Methods

The figure above gives a chronological record of research done in the three schools.

As my enquiry continued and developed, I was constantly not only modifying my behaviour but also experiencing development as a teacher through trying to articulate both high and low points on a daily basis. The nearest recognisable research method is thus action research (3.7.1) but on a micro rather than a macro level. There were periods of

reflection, writing, re-planning and trying things out but from day to day as well as term to term. Furthermore, as I probed more deeply into my teaching, I found myself articulating and re-articulating my beliefs in the light of my emerging practices and my practices in the light of my developing beliefs. Thus my enquiry was as much into myself as into my actions, as much about my sensitivities as about what I did. Throughout, I never lost sight of my main aim of helping the children make real contact with mathematical thinking.

As a consequence, this thesis is as much about methodology in the context of my mathematics lessons as it is about teaching mathematics to children with EBD. What emerges in the form of “Key Principles, Findings and Themes” (chapters 4 and 5) is a statement about me, even though the findings may act as pointers for other colleagues.

My methodology emerged and developed, is still emerging and developing, precisely because it is intimately bound up with epistemological issues, issues of validity and robustness but most centrally, with issues about my own beliefs and perspectives.

Consequently, the bulk of this chapter is a necessary immersion in my enquiry concerning my teaching, interspersed with methodological reflections.

The fundamental principle lying behind the way I approach my research is that the evidence I produce is grounded in my experiences with pupils in the classroom. My methodological approach emerged over a period of two years (1996-8) while I was writing my research diary at Mardell School. I was clear that my approach was experimental in that I was using various ‘tools’ of research (diaries, interviews, video-records) not only to explore my own practice but also to reveal the pupils’ attitudes to my teaching of mathematics.

### 3.1.2 Experience-led Approach

At this point, I am going to identify a series of questions (in bold), which act as a guide to my personal exploration of my practice.

Attending to the shape and look of the environment revealed my attitude to mathematics for the children (Kellie- “You like patterns, don’t you, Miss”). I now see that viewing my classroom as an object of enquiry was part of my method. On the walls posters were displayed, as were the pupils’ work on polygon patterns, spirals and circles. The classroom is the outer shell within which I use my imagination, creativity and inventiveness to develop a mathematics curriculum. In turn, the curriculum allows the children to be creative and inventive through their own mathematical experiences. The choice of what to put on the walls reveals my inner values. I have a strong sense of what fits (colour and variety is important) and what does not fit (anything that lacks impact). Kellie in her comment above ‘mirrors’ my internal world.

This external representation of an internal ethos was intended to communicate to the pupils my belief system about mathematics. A more direct way of communicating this to the pupils was through the way I chose to teach mathematics. (I became interested in choice for pupils at a later date – 5.2.8.)

#### **How have I come to an understanding of my internal ethos?**

Here I am talking about the beliefs that characterise my practice and distinguish it from others. Such beliefs are distinct from a value system, which represents a unified whole consisting of core values and peripheral (but related) values, as those beliefs capture the essence of the driving force behind my practice. In other words, I am motivated by a set of

loosely held beliefs rather than a coherent system of values. I now attempt to bring coherence to my beliefs or values by asking questions about the process that I have experienced.

My beliefs about teaching are indistinguishable from my beliefs about teaching mathematics. Therefore, the way that I have learnt to be a teacher is a process containing the development of my beliefs about mathematics and mathematics teaching. Without mathematics there is no practice; without teaching it there is no mathematics.

The question about ethos is a subset of a major question concerning epistemology.

## **3.2 EPISTEMOLOGY**

### **3.2.1 Introduction**

The question I need to address at this point is, **“How did I come to know what I claim to know? How did I decide what it was that I needed to know?”**

In order to answer such fundamental questions, it was necessary to uncover the process of coming to know and understand myself as a teacher – at what point did I become recognisable to myself? In the sections to come I intend to describe this process in order to mark certain stages in my development as a teacher/researcher. The stage of recognition is that which leads me to a greater understanding of the purpose of my research. Recognising myself as a practitioner with an internal ethos, a value system and a set of fundamental beliefs paves the way for further cognisance of my goals.

*Critical knowing* is the goal towards which I am journeying in order to achieve a critical understanding of myself, how I behave and the personal theories that inform my actions. Critical knowing implies marking transitions from one state to another. I do not reject other types of knowing but conventional or empirical knowledge represents the early state leading to critical knowing through shared meaning as the later state.

Developing a methodology was a journey borne of necessity arising from a search for *the* research question. The broad area of research was not an issue, centred as it was on my own practice. In a desire to reach a better understanding of the impact of my teaching, I started to observe, note and diarise.

It was my interaction with various research techniques (videotaping, interviewing, observing) that led to the framing of a research question about the accessibility of mathematics (1.3.2).

### **3.2.2 The Lone Journal-Writer**

To begin with, **how did I define that which I considered to constitute *my practice*?** It was a journey experienced alone in the recording (in a journal) of emotional reactions to chosen events. The journal acts as a vehicle for the journey. In order to fully understand this journey, I had to excavate the foundations of my motivations (ie. my 'raison d'être') and identify my philosophical position at the beginning of the research after interacting with mathematics and the teaching of mathematics for 16 years. In order to find answers to this question I find myself asking more questions. Reflecting in the diary raised more questions about my practice and experiences.

**What did I want to achieve through my teaching?**

Part of the story is about how long-held beliefs and assumptions were shaken by experiences. I had to lay myself bare to the questioning of my very existence as a teacher. Without this, I could not continue the journey that was the research process and I could not find my place in the story of the development of my practice. It could have been a soul-destroying process – in the same way that teaching practice (in 1980) led me to question whether I had chosen the right profession; examining and re-examining my *teacher-ability* led me to redefine my role as teacher of mathematics.

**What is it that drives me to teach?**

### Summary of Questions

- **How have I come to an understanding of my internal ethos?**
- **How did I come to know what I claim to know?**
- **How did I decide what it was that I needed to know?**
- **How did I define that which I considered to constitute my practice?**
- **What did I want to achieve through my teaching?**
- **What is it that drives me to teach?**

I shall now address these questions in relation to extracts from my research diary. The extracts will serve to highlight an epistemological or methodological statement. Before I do so I need to acknowledge my own position of vulnerability in relation to the children.

### **3.2.3 The Vulnerable**

As what did I want to be seen? All the teachers whom I valued as a pupil had one enviable quality – that of *kindness*. Difficult to quantify but easy to recognise, kindness comes from

an innate proclivity to *care* for another living being. From my experience as a pupil, this was the quality I most admired in my teachers and this was the way that I wanted to be seen by the pupils. Therefore, I could not respect the male teacher who smacked me (aged 10) during a tantrum, which was my reaction to his detention. (Later, as a teacher it was imperative that I positioned myself as ‘other’ to his dominant male – it is why I have tried not to dominate children.) Now I can understand how helpless he must have felt in relation to this child who was out of control. It is a position most teachers find themselves in at some time – trying to control pupils who lack self-control but desperately seek the ability to be responsible for their own actions. Continuing a habit is easier than redefining oneself as a responsible human being. How can I empathise with a teacher who abused me as a child? Only in the sense that I have been abused myself as a teacher. To be attacked by a pupil who has lost control of his senses and sees the teacher as an easy target for his anger (transference) is at one with the teacher seeing herself as a target for an ‘unknown’ pupil’s anger (‘unknown’ in the sense that the behaviour is unpredictable). The male pupil’s emotion can manifest itself as power over a vulnerable female teacher. I have experienced an overwhelming feeling of helplessness in the face of a male protagonist, represented as an angry unknown (because emotion-driven behaviour is not predictable). I take a significant risk by laying myself open to receive the transference of his anger because the conflict may not be resolved in this manner. Here, the emotion is larger than the sum of the participants’ ability to resolve the conflict.

In order to understand what motivates me, I need to draw on my past experiences of vulnerability and analyse how they contribute to my relationships with vulnerable children. I believe that this is the basis for the quality of empathy, which I try to convey.

### 3.2.4 Self-Development

Walker (1985) describes the journal or 'portfolio' primarily as an instrument for self-development – writing it brings insights into one's inner journey. The process requires honesty as any existing ideas of the self built up over the years need to be challenged in order to deepen reflection. The ideas that I can identify as delusive are those which, upon reflection, ireresonate with current perceptions of myself as a teacher. The way I wrote five years ago is not the way I write today. Every time I revisit an episode I am aware of interpreting it in a different way. I could interpret the initial analysis as one masked by my emotions, as Walker claims. Only unmasking these will lead to further self-knowledge. However, identifying layers of interpretations does not necessarily make the initial interpretation false, only naive. The next layer is then a more intelligent interpretation.

Returning to my research diary, I can see how writing about emotional episodes achieves this end. An early example occurred during a Year 9 lesson at Mardell School (11.12.96). I gave the three boys (George, David and Damien) a sheet of 96 multiplication and division questions to do but then became preoccupied with George, who refused to do the work.

“The others didn't ask for help –Damien was making a few mistakes as I discovered when I marked his [work] later but I didn't interfere as they wanted to compete.”

The real reason for not interfering was fear of upsetting Damien irrevocably and the fact that I felt I could cope with one difficult pupil but not two. It was an avoidance tactic, which did not aid Damien's immediate understanding of multiplication and division. Had I been braver and stuck to my principles of equal opportunities I would have rated Damien's



learning experience on a par with George's. Because Damien was not demanding my attention, I was relieved not to have to give it.

From this simple episode, a mix of reason and emotion can be discerned in my decision-making. Fear is apparent but also sensitivity. I am trying to avoid creating a situation of such emotional difficulty that I could not cope. The decision is a coping mechanism (Lazarus, see 2.7.2) following a perceived threat to my ability to teach. The decision allowed me to manage all three boys but arguably to teach only one, George, who was demanding the most attention.

Having identified that the initial perception of myself ireresonates with later perceptions, **what is the extent to which I can use this to advance my self-knowledge?** Answering the questions summarised at the end of 3.2.2 may take me further towards this goal.

However, achieving this end requires attention to other questions.

### **1. How do I recognise discordance in the original interpretation of my behaviour ?**

Part of the skill of teaching is knowing when to (and when not to) intervene in a pupil's learning by questioning, directing, suggesting and advising. 'Leaving be' is not an absence of action but a deliberate act in itself. In order to interpret this act, I need to find a precedent in previous examples of my practice. Thinking back through my experience, in order to manage a class of thirty children (in a mainstream school) I would stand, or sit, at the front of the class, employ whole class teaching methods and use non-verbal cues (a pause, a look) to discipline children who were not paying attention. I did not even attempt to teach George, David and Damian in the same way as they did not form a cohesive group where 'mainstream' cultural norms presided. In the mainstream class I knew that my main preoccupation was to keep order, whilst also acknowledging that some children would be left behind in their understanding by my methods. To place competition (ie. who can be the

first to get the correct answer) ahead of understanding, therefore, does not accord with my fundamental values.

I am tempted to conclude that to unearth the ‘real me’ from this façade is impossible without some knowledge of the ‘real me’, otherwise how will I recognise her? One strategy is to keep asking ‘*why?*’ until I can find no further explanation. Another strategy, in conjunction with this, is to use my response to a vignette to discover the characteristic *me*. Poulou (2001) argues that vignettes (used in conjunction with interview techniques) can reveal the teacher’s cognitive schemata as well as their beliefs and values. Poulou quotes a vignette devised by Brophy and McClasin, which resonates with daily behaviour in my classroom:

Joe could be a capable student, but his self-concept is so poor that he actually describes himself as stupid. He makes no serious attempt to learn shrugging off responsibility by saying that the ‘stuff’ is too hard for him. Right now he is dawdling instead of getting started on an assignment that you know he can do. You know that if you approach him he will begin to complain that the assignment is too hard and that he can’t do it. (p. 52)

As I study my reaction upon reading this vignette, I recognise that I do the same when I study my response to incidents in my classroom. I can imagine the scenario – I take the pen from his hand, grab a chair, sit next to Joe and write the title and the date on his paper. I do the first question with (for) him to demonstrate that he can do the work. If he is still complaining and turns his body away from me, I leave him for a few minutes and go to another pupil. If, when I return to Joe, he is still refusing to work, I give him the option of leaving the classroom and doing the work at lunchtime or after school, or staying and

attempting the work now. Knowledge of the pupil determines the timing of my interventions.

## **2. What does my response reveal about my beliefs and values?**

I have no doubt that this is the 'real me' as it is an example of a repeated behaviour on my part. First, I ask 'Why?'

I *know* that the boy's behaviour is attention-seeking, as this convenient label covers most behaviour by pupils with EBD. Therefore, I give him attention but the attention is focused on his work, not on his emotional difficulties. (Later, I find the capacity to give attention to both.) This direct intervention is followed by a period of allowing Joe space to make a decision. If he decides not to work, I give him the choice of when to work, making it clear that the work *will* be done. In my experience, most choose to stay but some choose to leave because they know that they will lose control if they stay. Removing the child from the lesson gives him the opportunity to speak to an adult about his difficulty and helps the rest of the class to settle.

My attitude transmits my priorities; work first, emotional difficulties second. In the example of Damien, my main motivation is fear. Five years later, I am more willing to confront the verbal or emotional abuse that may result from my actions. This may be because I have a more positive image of myself as a teacher and of my ability to create opportunities for understanding among the pupils.

**2. How do I know that my re-interpretation explains my true motivations?** My motivations are only 'true' in the sense that the interpretations are multi-layered and the latest layer reveals deeper motivations.

Referring to the same diary extract of 11.12.96 (p.71), I provided an explanation for the boys' motivation. At the beginning of the lesson, I said,

Let's make this a competition and see who can be the first to finish.

David said, "What do we get if we are – an extra certificate?"

I said, "Yes but you have to be accurate."

The other two were eager and started straightaway when I gave out the sheets but George said,

"I'm not doing this. I'm refusing to work."

I said, "Well, you don't have to take part in the competition."

I took a gamble in the hope of motivating them to work. The risk is illustrated in George's reaction because he was sure that he could not do division (based on past experience).

Whereas David knew that he could but would only do so for a concrete reward. Damien had to compete under any circumstances and, in a bid not to be left behind, attempted the questions even when he was unsure whether he was using the right method.

Three boys, each with a separate goal, test my commitment not just to teaching but also to them as my students. At the deepest level of self-motivation, am I basically egocentric, instinctively thinking of myself first and the needs of the pupils second?

**3. Does the episode provide an insight into what I wanted to achieve through my teaching?** I took for granted the mathematical objectives (ie. reiteration of multiplication skills, using multiplication facts to divide) so these were not foremost in my mind. What were my cognitive schemata? That is, what do I believe are the conceptual structures about how pupils think and learn?

Diary, Mardell School, 11.12.96

They learn/remember by repetition.

Mardell School, George, 11.12.96

He said he wasn't doing decimals. I was puzzled because there were no decimals on the sheet I said "Where?" and he pointed to the division. I realised he was referring to the last time we did division (2 weeks ago) when I made them put the remainders as decimals. He had done quite well on that at the time but now he was objecting to it. He called them 'skanky'.

I said, "Start with the multiplication". He repeated that he wasn't doing the division but he would do the multiplication.

He started the multiplication, calling out to me at my desk to check a few answers, eg. "Miss, are 8 threes 24?" I would say "Yes" then he'd carry on and he might check the final answer with me.

When George finished the multiplications he got up and walked to the window but instead of being so vehement as before, he was now whining "Oh, I don't want to do these, Miss".

At this point I repeated something I had said earlier, which was "I don't see why not because they're just the reverse of multiplying". He went back to his seat and I followed him. The first question was  $28/2$ . I said "How many twos in twenty-eight? That's like asking "Two times what is twenty-eight?"

He repeated my last question, thought about it, then said “Two fourteens are twenty-eight”.

“That’s right” I said “so write fourteen there”.

The next sum was  $36/2$ . George said “Two thirty-sixes, that’s easy.”

I had to intervene quickly so that he wouldn’t get muddled up.

‘No – two times what is thirty-six?’

“Oh” he said then had a guess at nineteen.

‘Too high’ I said.

“Eighteen” he said next.

“Yes, good” I encouraged him.

This diary extract illustrates how George learns. It is an example of Vygotsky’s *Zone of Proximal Development* (Vygotsky, 1978) in that I refer back to what he knows (multiplication) in order to move him on to a more advanced level (division). George needs regular affirmation in order to learn with confidence (the need to check his answers with me). He reveals a misconception when interpreting thirty-six divided by two as two thirty-sixes. Then he appears to learn through trial and error, trying out different answers. My initial comment about learning through repetition now appears too simplistic as an explanation.

How did I motivate George to work (eventually)? This extract illustrates *being there* for George. I showed him what he could do to begin with then how he could use what he knew to develop his skills of division. For me, as the teacher in this episode, *being there* is an emotional existence – it implies fluidity not stasis. It is both a physical state and an emotional interaction; hence the term ‘living concept’, which I define as a concept that is context-specific.

**4. How does this episode help define my practice? How does it help me understand my internal ethos?**

Central to my internal ethos is the living concept of *being there*. The diary extract represents an early example before I became aware of this concept. At the time, it took the form of quiet affirmation: I can find my internal ethos in my personal values (3.3.1).

**5. How does reflecting on this episode contribute to my self-development?** The message that comes across strongly is that initial reflections are not enough – descriptive episodes need to be kept intact so that they can be returned to again and again. Each time I return I can find a different interpretation of an event, can pare another layer from the surface of my experiences. Reflection does become deeper. Writing initially cannot in itself contribute to self-development; it is what I do with it. To what extent do I use and re-use the episode to try and reach a deeper understanding of the interactions in my classroom? One reflection is not enough – learning about my practice is an ongoing process. I develop my practice through reflection.

Do I need to write about my feelings in depth before I can begin to reflect? I refute the need for this; at some level reflection can always take place before writing but the process of reflection is never complete. Reflecting-in-writing represents the external manifestation

of my inner journey – these reflections can also be reflected upon. During this process, my feelings emerge in ever greater depth.

Ironically, reflecting raises more questions than answers. The process of challenging initial ideas about myself allows for deeper reflection in that it prompts a series of questions, which attempt to roll back each layer of self-motivation. Deep reflection is like eavesdropping on my own inner dialogue – taking the role of third person, I listen to my voice questioning myself. It can be defined as an inner form of triangulation where I, as researcher, must untangle the threads of many conversations.

### **3.3 MY PRACTICE**

#### **3.3.1 Personal Values**

The values that lie at the core of my practice have been clarified through the research. Part of the entanglement of the many threads of my research stems from a search for my deeply held beliefs about teaching. When I ask my inner voice “What do I believe and why do I believe it?” the answers given are incoherent at first as I try to identify that which I take for granted. It is important for me to ask these questions because I cannot define my practice without reference to the underlying beliefs that provide a clue to my motivations in the classroom.

For example, I was unsure what to expect from students with EBD in terms of work rate and capabilities. My first lesson at Mardell with a Year 9 class was characterised by a refusal to do the work set because it was insultingly easy (in the students’ views). Consequently I struggled to change the work to meet their needs. Two of the boys would not look me in the eye. Changing my initial beliefs, I then went to the other extreme.



Diary Extract: 11.10.96, Ben, Year 10, Mardell School

In between helping Ian and Kenneth, I was working with Ben on brackets again. He made the same error as yesterday. The question was  $(2a + 3)$  squared, ie.  $(2a + 3)(2a + 3)$  and he could successfully work out the beginning,  $4a^2$ , and end  $(+9)$  of the expression but put  $4a \times 3 + 3 \times 4a$  instead of  $2a \times 3 + 3 \times 2a$ . He had difficulty seeing that that was  $6a + 6a = 12a$ . He thought it should be  $12a^2$ . I tried to explain:

“If I had 6 rulers here and 6 rulers there, I would have 12 rulers altogether, wouldn't I? So if I have 6  $a$ 's plus 6  $a$ 's, I've got 12  $a$ 's altogether. The  $a$  doesn't change. It's only when you multiply ' $a$  times  $a$ ' that you get ' $a$  squared'.”

Ben tried the next one as I moved away but when I came back I realised that this one was backwards, ie.  $(1 + 6a)$ . I said as much to Ben, “That one's harder”.

“I figured it was still the same,” he said.

I agreed but said he wouldn't be able to reverse the terms if it was a minus sign.

There was still some problem of understanding with this one. He was writing  $a = 12$  as his answer or  $a = 28$ . I told him that the problem was not to find  $a$  but just to simplify the expression.

When I was with Kenneth over the other side of the room, Ben called out, “I'm bored with this” and other such noises.

I said, “Is it too hard?”

“No. it’s just getting boring now.”

Before the end of the lesson he got up and walked to the window. While he was there I repeated that the work was too hard. “Perhaps it’s something we can come back to next year.”

“Or perhaps never.”

I had introduced brackets to Ben during the previous lesson (the day before, 3.6.4, p.118) and I commented at the time:

The jump was too great [between the easier type of question and the harder type] he should have had more of the easier type to do – this caused problems the next lesson. On the surface this was a successful lesson but it laid the foundations for problems later.

Arising from reflection on this episode (and others), I realised that I had to replace the students’ lack of belief in themselves with my own belief in them, which is an essential part of *being there*. I came to this realisation through recognition of the dependency of each child (including Ben) on how I taught and my sensitivity to his “emotional commitment to mathematics”. Due to his natural ability or interest he is willing to channel his energies away from negative emotions towards the positive experiences in mathematics. It was not until I started focusing on the child’s feelings and perceptions (through interviews and case studies) that I could see the importance of my attitudes and perspectives for each child’s potential. *Relationships* became the key to unlocking both our worlds.

This is how I came to know that one of the most basic beliefs that I hold is:

**all children *can do* mathematics.**

### 3.3.2 Temporary confusion

I was made aware of another related belief when I read Trickett and Sulke (op.cit.): "...a state of temporary confusion or puzzlement is at the heart of all learning." (p.111) Instinctively I knew that this statement did not correlate with my beliefs about how children learn. I do not believe that this is an appropriate way for children with EBD to learn mathematics. Confusion or puzzlement, however temporary, can only lead to frustration due to connections made (possibly unconsciously) with earlier (or current) emotional experiences.

I then searched for examples of how I felt the last time I learnt something. I now want to be aware of how that search felt – how I came to know what it felt like to learn something. I call it a 'state of unknowing' rather than confusion. In my mind I searched for an incident - a frustrating experience that felt like I was continually approaching a dead end. I only accept that I have learnt something if I interpret the experience as such. If I ask my students what they have learnt in today's lesson they reply "percentages", for example. If I then question further, they tell me "how to work out 10%" because I have told them that that is what they are going to learn. I have no one to tell me what I am going to learn. On a simple level, if I come across a word that is new to me, I ask myself "What does that word mean?" (puzzlement). I look the word up in a dictionary and replace the word in its context in order to give it meaning. On a deeper level, learning about my practice is a long journey that seems to have no end. Trying to jump on board at a certain place along that journey is an apperception; I perceive that what I experience is not only cutting across the aggregate of my experiences but also provides contiguity. Retelling the story of my experiences is a

journey parallel to another journey. On one side are my past experiences to date; on the other runs the cognitive analysis of experience.

I can illustrate the effects of confusion from a pupil's point of view.

Kieran, Year 9, 28.11.00, Canfield School

Kieran is in a state of confusion about fractions (is  $2/5 >$  or  $< 1/2?$ ). He does not know what the temporal quality of a *state* is therefore, the unacceptable feelings seem to last an intolerably long time to him; he cannot sustain them for five seconds let alone five minutes. He literally wails in anguish when he does not understand. I need to remain calm and then explain again. He hates to fail; he hates to lose. If we play class games he has to be on the winning side otherwise he sulks that "it's not fair".

If not understanding is unbearable, what does Kieran learn in his temporary state of confusion? The learning should come at the end of his confusion but does the anguished mental state obfuscate the learning? The ability to learn (ie. a recognition of what is possible to learn) is there but is obscured by the emotional turmoil. This leads to the question of how frustration contributes to learning. How does frustration compare to *confusion*? In order to learn, 'feeling confused' assumes the ability to persist through the confusion until one understands and, therefore, learns. However, the frustration blocks the process of perseverance.

Of course it is possible to be in a "temporary state of understanding" (to paraphrase) - it is when this state becomes permanent that we have truly *learnt*.

If the teacher's role is to reduce stress then **the child must not struggle too much with the mathematics.**

### 3.3.3 Change in Attitude

Last year, I believed that my attitude had changed over a period of three years (1997-2000). When I started teaching children with emotional and behavioural difficulties, I was determined not to treat them any differently from children in mainstream schools. Three years ago I wrote that I did not treat them any differently because they have emotional problems. I would qualify that statement today by maintaining the right to be flexible in the light of apparent emotional difficulties. This represented a shift in my belief, as a result of teaching the children for two years. However, upon examining my motives, I may not have shifted as far as I first assumed – I still put mathematical *wants* first rather than emotional *needs*.

#### Diary Extract 3.3.97, Freddie, Year 9

Freddie started on the 24 Feb. Today he returned his record sheet and his mother had written: "How have you managed to get Freddie enthusiastic about maths? It's miraculous!" When he came on his visit Mr I brought him and his mother into the classroom announcing, "Freddie says that he hates maths".

What has turned him around in such a short space of time? I think the main factor was that I was prepared to take a stand for him because I believe in his ability to work alongside Year 9, even though he was Year 8 and should have been following the Year 8 scheme of work. He can do long multiplication and division

and addition of fractions. We did long multiplication in our first arithmetic lesson (26 Feb.) and, whereas the others found them difficult, Freddie found them easy. Every time I put 4 questions on the board, he yelled, “done that” so I checked the answers then put more questions on the board. When he’d done a really difficult question I smiled at him and said, “Well done!”

The answer to the question posed by Freddie’s mother has a lot to do with the positive feedback for Freddie’s efforts and the fact that I enabled him to succeed in mathematics lessons.

### **3.3.4 Interactions**

The value of relationships is all-important within the EBD setting due to the social nature of emotional and behavioural difficulties (now recognised in the title Emotional, Behavioural and Social Difficulties (SEN Code of Practice, January, 2002)) but also due to the higher level of interactions possible with smaller classes. Clausen has stated,

“Relationships are what our children fail at.” (1991:21)

I believe that teachers should take on a parental role where this is known to be inadequate in the pupil’s home life. The teacher can model appropriate adult behaviour (without having to be a paragon of virtue). Children should know that teachers are human beings with human emotions and thus are fallible, but at the same time can focus on the caring, nurturing part of the adult-child relationship. Part of the nurturing process can be achieved through the medium of mathematics.

I treat the class as interacting individuals rather than an entity in itself. Feelings emerge from interactions – they are not the sole property of the instigator. In figure 3.3.4 the anger that created the fear has become the property of both participants (and any others who might intervene) as one emotion sparks off another. Person 2 feels fear as a result of Person 1's anger. Person 1 becomes aware of this fear but her anger is projected back to her, as is the fear to Person 2.

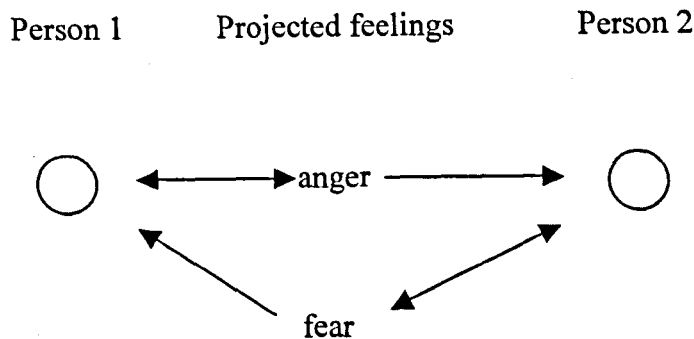


Fig 3.3.4 Interactions

The feelings have been projected, reacted to and altered (in intensity or form) in the process.

I assume that the classroom is a challenging place for the pupil with EBD as opposed to viewing the pupil as challenging in the classroom. This is an important distinction because most of the literature takes the latter approach.

Both teacher and pupil come to a situation that is potentially extremely stress-inducing; they need to find a way of connecting or interacting that reduces stress. Therefore, the ultimate goal of each meeting is the creation and maintenance of a *comfort zone* – an area in which both teacher and pupil feel comfortable with what is expected of them. A comfort zone cannot exist without trust and personal evaluation on both sides, leading to a mutual

understanding. The ability to empathise is important for a teacher and particularly so for the teacher of children with EBD; I am able to convey this to the children by 'being there' for them. 'Being there' can have a physical proximity but it is also symbolic in that it is the sign of an idea or process whereby I value each individual and the work she produces. I am there as an adult who can be depended upon to teach mathematics and to listen to what each pupil has to say, although I place greater value on talk that is relevant to mathematics.

In contrast, Pierce (1994), in her observations of one effective teacher, found that the teacher modelled appropriate behaviours by taking on different roles as a person, counsellor, encourager or safety net, who would discuss with them her feelings about life and family. Her students appreciated her caring behaviour towards them outside the classroom as well as in – she was not afraid to touch or hug them. In this way, each child knew she or he was valued.

Certain factors enable me to 'be there' for the pupils. One is the physical environment; in the EBD schools in which I have taught the maximum class size is 8 and often classes are smaller than this. Relationships develop more quickly in this setting. Children become closer to adults, both physically and emotionally and, consequently, their (sometimes unreasonable) demands can place a strain on relationships. This is particularly so when children attempt to project their feelings of anger and frustration onto the adult and find their negative feelings reflected back, reinforcing their difficulties.

The comfort zone can be achieved and then lost at any time if one participant is no longer happy with the expectations of the other (or an outside agent). For example, Barry (Year 10, 27.3.01) is happy to work on formulae from the SMP booklets as he remembers doing them two years ago when he was in Year 8. The booklets represent security for him. He would even opt to do them in a cover lesson rather than play games. We are both happy



with this situation but as soon as his emotional make-up changes both our states of *comfort* are blighted. Barry suffers from depression, which manifests as extreme lack of co-operation and violence towards his peers. When I asked him why he threw a pen at his classmate, he replied that he did not have anything else to do with the pen because he had finished writing. His (unspoken) message to me was “Keep me occupied with the maths, allow me to concentrate on solving problems and I will forget that I am me”.

In my view, the teacher’s role is not to add to the child’s problems but to provide the individual with alternative means of coping with potentially stressful encounters. The teacher does this by making continual assessments of the pupil’s affective state while teaching. For example, while teaching Stuart long multiplication (15.2.01) it became apparent that Stuart was becoming increasingly agitated (this state manifested itself in the number of screwed up pieces of paper aimed at the bin). The method was too complicated for him so we both seemed to come to the simultaneous conclusion that he would be better off doing short multiplication first. Basically, the expectation is that the teacher teaches while the child meets the teacher’s objectives for the lesson.

Another factor is liking the children in the sense of valuing them without judgement or assigning blame for their situation. For Greenhalgh (op.cit.) responding to the child at a relationship level is more likely to make the child responsible for her own behaviour and learning. The teacher does this by reflecting back the symptoms of the problem as displayed by the child: for example, giving a non-judgemental commentary on the child’s behaviour in order to increase her self-awareness and develop her ego. By reflecting back the child’s qualities, the teacher gives her a consistent picture of herself. The qualities of the teacher-pupil relationship – liking, empathy, attentiveness, sympathy – make ‘emotional holding’ (Greenhalgh, op.cit.) possible, whereby the adult demonstrates that distressing feelings can be tolerated and helps the child to manage her feelings by

thinking about their meaning.

In comparison to Greenhalgh's approach, I can demonstrate tolerance of feelings by accepting the validity of those feelings and working with the child to achieve a mutually satisfactory outcome. It must be emphasised that this is the intention but, just as the child may not always be able to contemplate the meaning of her feelings, the outcome of an encounter may not always be satisfactory.

Diary Extract, 25.4.97, Tanya, Year 9, Mardell School

David lost his temper over something he alleged George had said about his mum and the three boys (Damien joined in) were arguing and bickering. [I called for a senior teacher.] Tanya was trying to work at the back of the class and was getting frustrated because she couldn't concentrate. She pushed her (practice) SAT paper to the floor.

I left the melee in the hands of Mrs X, picked up the paper and put it back on Tanya's desk. Ignoring what was going on in the rest of the room. I read the question quickly.

"I don't get what you have to do," Tanya appealed to me.

It was a question about completing a pie chart. She had written answers to the first two parts: 40% and 20% for land north and south of the Equator. I ascertained that she had to add the two together in order to draw the pie chart: 60% land, 40% water.

“So, if I draw a line there is that right?”

“Yes and then label each part.”

Tanya seemed calm by now and David had been taken out. I could have used a strategy of ignoring her – just leaving her until she had calmed down by herself but she might not have done. I could have demanded that she pick up the paper herself, which might have led to a confrontation.

This proved to be a satisfactory outcome for both of us, although I had to ignore the rest of the class for a time (helped by the presence of another adult) for it to be possible.

### **3.3.5 Imaginative Mathematics**

The central tenet of situated learning is that learning takes place within a context. Some writers (Porter, 2000) deduce from this that linking mathematics to everyday experience motivates learners to learn mathematics more effectively. I do not agree with the need to ‘mathematize’ everyday experience in order to achieve the same end (Lave op.cit.). This relates to my belief in equal opportunities.

I believe in equal opportunities, by which I mean that everyone has the right to the same quality of teaching and learning irrespective of social and political expectations in the name of ‘relevance’. A restricted curriculum based on life skills so that youngsters can cope better after they leave school does not represent equal opportunities. With their future delimited, there is no opportunity even to recognise that young people have potential let alone might be able to reach it. What the students do at school does not have to have an immediately obvious use to them or their future – one cannot predict what will be useful in the future anyway - just so long as it enriches their experience of mathematics.

Early on in the research process, I found that one motivating force is the use of large-scale mathematics to capture the imagination. For example, investigations like “How many blades of grass are there on the school field?” are not rooted in reality but, with the proviso that only non-standard means of measurement can be used, the problem can be situated in the learners’ own experience so that they use what they know to find out more. According to Mercer (1992) all learning is situated because the task does not exist independently of the ways participants contextualise it. For example, a child is asked to make up 10 word problems using the 7 times table. Each problem starts “7 monkeys went into a shop...” The child suspends disbelief in order to conceptualise the problem in his own terms.

My aim is for each student to develop the widest possible view of what mathematics is: investigations, practicals, mental arithmetic, bookwork, geometry, trigonometry, graphic calculators, computers, mathematical imagery, problem-solving, puzzles, pattern-making. Variety is the key. A SENCO (Special Educational Needs Co-ordinator) from a mainstream school once commented to me that “these kids” need a different curriculum. I take issue with this view as I have always said that they should have access to the same curriculum as everyone else.

Students’ views on the nature of mathematics are determined by their past teachers. For instance, a student may feel that ‘proper maths’ is working from a book and, as this is what he is used to, he will be resistant to change in the form of more practical mathematics.

Diary Extract, 24.9.99, Ewan, Year 8, Canfield School

Ewan moaned today (after I had taught him for 3 weeks) “Why don’t we ever do proper maths from books? Why do you get us doing these things all the time?”

By “these things” he meant the games and whole class activities we do like making the race-track. I should have argued “You don’t find maths only in books, you know” but I was too busy.

Ewan’s previous teacher had set each child a book, depending on his National Curriculum level, so that when I started to teach at the beginning of September I was met with, “That’s not my book! I’m on Book 5”. I would rather teach by topic and find different resources to fit the topic.

I believe that mathematics has an intrinsic value; it can be enjoyed for its own sake but is a vital resource to take through life. It is difficult to explain the value of mathematics when challenged (“Why do we have to do this?”) but I know the value of each activity in terms of the concepts that can be revealed by working through the problem. By choosing a particular activity (or single concept) I am investing it with value. If I then take an active part in the lesson and model the learning process (and invite the classroom assistant to do the same) it is in the belief that this will encourage the pupils to imitate my behaviour.

Audiotape Transcript, 19.1.99, 7B, Breesdale School

[The whole class activity on probability is called “What’s in the bag?” The pupils know how many different coloured cubes are in the bag and they must predict which colour will be picked next. The tape recorder is in front of Edward and Graham.]

T = Teacher, E = Edward, G = Graham, P = Classroom assistant

G Let me put my hand in.

T Put your hand in – don't look.

G Can you check?

T Don't change your answer. It's another green!

(Cheers from the class. G screams.)

E Graham, you stupid...

(Game continues)

T Oooh, it's brown!

G/E Yeah! (Laughter)

E You writ it in.

G (Laughs) I did I...

T There are no prizes for getting it right so it doesn't matter if you get it right or wrong. There's no point in changing it. Fourth guess.

E I wanna go! I wanna go! I wanna go!

P Edward. Listen. Fourth guess.

E Fourth guess?

P Remember two greens and a brown have come out now so think.

E I want RED.

P Right. Well done.

I try to embody the value of mathematics by showing that I enjoy doing and teaching mathematics and encouraging children to think mathematically.

### 3.3.6 Attitudes

One insight that I have been able to make through the research is **that pupils' attitudes to mathematics are filtered through the attitudes of the teacher.** Observations by the pupils have reflected back to me my own attitudes to mathematics. In other words, the

teacher's attitudes towards teaching and towards mathematics are strongly transmitted, picked up by pupils who then adapt their own attitudes towards the teacher and mathematics. For example, I transmit my enjoyment at working with them, my frustration at their behaviour, my belief in the power of mathematics to subjugate emotional difficulties and to bring success so that the children realise that they 'can do' mathematics.

Also they discover that they 'can do' mathematics together as a social unit. The students have taught me that learning is not a passive process; their learning is done very publicly. This has a great advantage to me as a teacher as it is easier to check their understanding and redirect them if appropriate. I encourage them to share their methods of problem-solving, inviting them to write on the board. Now I see mathematics more as a social activity than I did when I was teaching in mainstream. I used to see it as an activity best done on one's own; now I feel it is best done by the whole group or class.

Diary Extract, 14.4.97, Year 9, Mardell School

Year 9 had been working out problems using Pythagoras' theorem but one question was not accompanied by a diagram so I decided to see if they could draw the diagram first and invited them, one at a time, to sketch this on the board. They had to represent a tower 10m high and a cable from the top of the tower to a point 4m from its base and then find out how long the cable was.

George came up and said, "I'll do it" but proceeded to scribble lines over the board. So I took the pen from him and told him to sit down. Then Freddie volunteered and drew an upside down T-shape for the tower and ground. I asked him which bit was the cable and he drew it parallel to the

ground 10m away. I explained that the cable was coming from the top of the tower to the ground and David jumped up and drew the cable correctly but labelled it 10m long. I asked Lorna if she wanted to have a go but she declined so I drew a right-angled triangle on the board and asked them to copy it. The two boys had not given themselves time to read the question carefully and visualise the whole picture; they approached it in parts and got the measurements mixed up. Once they could recognise the right-angled triangle they were able to calculate the length of the cable using Pythagoras.

This extract also illustrates the voluntary nature of social learning; both George and Lorna opted out of the public learning forum in different ways, Lorna taking the role of observer and George that of the clown. There is an element of risk-taking in this approach.

### **3.3.7 Motivation: Summary of My Practice**

I can trace my motivation for teaching mathematics to children with EBD back to my first experience of teaching in a secondary school. There is a line that runs through the last twenty-one years up to the present day. That is, that from the time I started teaching, I knew that I made a connection with 'difficult' children. It was a rapport built on my identification with them. I recall that twenty-one years ago, one girl's verbal abuse rendered me to tears. When I was told about her background and home life, I understood that I must stay one step removed from the personal insults and know that I am a temporary influence in that child's life. Seen from this perspective, behaviour can still be about our 'relationship' (or more simply, set of interactions) but it is a fleeting one for the child. In this particular instance, I surmise that the emotional episode had a more lasting effect on me than it had on the child. It is one of a number of past experiences when I felt



vulnerable in the face of strong-willed yet vulnerable children. The use of empathy (in those early days) while enabling me to try and connect with the emotional child, also served to highlight my own need for the same feelings from the child. I cannot connect with the emotional needs of the child unless I acknowledge my own emotional vulnerability.

Through my teaching I wanted to achieve a good relationship with my pupils; 'good' in the sense of an understanding between us that I am working for their benefit and, therefore, hope that they will respond to that. 'Emotional healing' was not a concept that arose in those early days. How does mathematics fit into this concept? The point of connection is made through mathematics. Number is a commonality as is language. We can speak words but they can be difficult to spell. They are also used to convey feelings. We learn to count before we learn to read – we recognise numbers before letters or words. The connection (from adult to child) is made through number. If we regard number as almost 'emotion-free', we can see how its use can bypass emotional difficulties. Of course, children can render emotional the act of *doing* mathematics in a social setting. Also, some authors (Weil-Kayley op.cit.) see number as 'emotion-laden' and a cause of difficulty. I believe that a number (eg. 2) cannot in itself (and its connotations) be a cause of difficulty. It needs to be put into context for its emotional meaning to surface. When that happens, the child connects with the context and not the number. The difficulty arises in the context to the problem.

If we regard number as 'emotion-free' then we can view the prospect of mathematics as a calming influence with greater probability. Mathematics has to be removed from the irrational in order to act as a soothing balm to the troubled child.

### 3.3.8 Summary of Research Assumptions

These are the assumptions that affect the research but are also uncovered by the research so that research and the product of research conflate to become a means of uncovering my values - a process of co-evolution and revelation. As a reflection of my values, the assumptions encapsulate the essence of my practice.

- The child does not have to struggle with mathematics.
- A class is viewed as interacting individuals rather than an entity.
- Use macro-problems to capture the imagination.
- Pupils' attitudes to mathematics are filtered through the attitude of the teacher.

In the following section I discuss epistemological questions (3.4) particularly the importance of critical knowing (3.2.1).

## 3.4 CRITICAL KNOWING

### 3.4.1 My Engagement with Constructivism

I first encountered Constructivism (in 1995) as a belief system that provides a distinct philosophical approach to the teaching of mathematics, particularly in the works of Lerman & Scott-Hodgetts (1991), Lerman (1994) and Jaworski (1994, 1995 – see 2.6.2 Constructivism). My engagement with Constructivism is an example of 'how I came to know' (3.2.1). I know that I cannot agree that mathematics is not an observable part of the environment but "exists within people's minds" (Jaworski, 1988). How did I come to know this? - from the simple assumption that mathematics is all around us and from having

studied the history of mathematics. I had studied how mathematicians had worked on the body of knowledge in order to advance mathematics.

I do not see why a 'body of knowledge' is incompatible with constructing knowledge for oneself. This represents a dual absolutist/constructivist view. In this case, it makes sense to state that mathematics in the natural world (eg. sunflower) is only there because of the interpretation that mathematicians put on it. However, the 'mathematical' sunflower then becomes part of an objective reality separate from the knower as well as existing in the mind of the knower. Therefore I can perceive the sunflower in absolute terms but also as a construct in the mind of the knower.

### 3.4.2 Implications and Intentions

The implications of accepting a dual absolutist/constructivist view are that I value my own store of knowledge and want to use this in my interactions with students.

Mathematics becomes an activity for discussion. Many times I have taught equations to KS4 by writing  $2a + 5 = 11$  on the board then waiting for students' responses. One Year 10 boy insisted that  $a$  must be 1 because  $a$  is the first letter in the alphabet. Others have ventured  $a = 4$  because they interpreted  $2a$  as  $2 + a$ . Another group of students arrived at the correct solution 3 because it is the only one that fits and allows the equation to make sense.

This 'story' represents three levels of knowledge and understanding aggregated in the different students' experiences. The first two misconceptions are difficult to erase but using the third group of students to remedy this by sharing their meaning alters the experiences of the others if they are able to internalise the new meaning. Hence, the knowledge does exist outside of the students as it is held in a forum for debate before it is

internalised, although for some it will always exist outside of them as understood by others but not themselves. Here I am attempting to bridge the gap so that the child makes his own connection between his body of meaningful knowledge and the new knowledge. I engaged with the literature on phenomenology directly from the standpoint of constructivism. The process by which mathematical knowledge is constituted in and by consciousness is the main interest of the phenomenologist. I 'constructed' the above story as a means for debating the construction of knowledge, while simultaneously unveiling my own beliefs.

For instance, I know about the mathematical properties of the sunflower. In teaching sequences I judge it to be desirable for my pupils somehow to *construct* the sequence so that it becomes part of their internal knowledge of mathematics. However, there may be no connection to previous knowledge. Relating mathematics to a phenomenon of nature may be a totally alien concept to the child who then struggles to understand. Each child, with a unique past experience interprets situations differently.

I agree with the phenomenologists that intentions are important; that we are disposed to perceive of situations in certain ways (Hall & Hall, 1988). This affects the interpretation of the child's behaviour. In the classroom the intentions of the child and the teacher meet. For instance, if the teacher knows that the child 'intends' to be anxious upon entering the classroom, the teacher can give the child "psychological space" (Salmon, 1995:65). Salmon has outlined a technique whereby the phenomenon (anxious child) can be seen as a problem but the focus has to be on looking behind the phenomenon and asking 'Why?' Repeating this question until the only answer is "because that is the way it should be" reveals the researcher's deeply held beliefs or, if the answer is "that is the way things are", the phenomenon could be a social construct and open to change (Tripp, op.cit.). I used this method in a conscious effort to reveal my beliefs.

When I ask myself, “Why is the child anxious?” my reply is “Fear of the unknown”, which could be directed towards the mathematical content of the lesson or peer interactions (Graham, 3.8.3, p.145) or both.

- The child’s anxiety about mathematics could be caused by past experiences of failure leading to low self-esteem. The child’s sense of failure may be due to her treatment by teachers, parents and peers when she could not meet their expectations (either academic or social). It could be that she has missed a period of schooling (usually due to exclusion and lack of alternative placement or refusal to attend school) and is aware of a lack of basic knowledge.

At this stage I can confidently state “that is the way things are” and, not only is change possible, it is also desirable. Remedial measures can be put in place and opportunities to enhance self-esteem can be created. (As I write this I have a sense of uncovering my beliefs about my function as a teacher; I am there to effect change for the better.) Mathematics cements the cracks in this vulnerable emotional base, providing a smooth foundation on which to build further mathematical experiences yielding another layer of self-esteem. I am looking at a phenomenon of the payback from incremental success at mathematics. Each success fills a gap in the child’s self-esteem and his self-image can be redrawn with every subsequent success. Any mathematical failures produce stasis in this development.

- Should we take the alternative path where the fear is of possible adverse peer interactions and ask, “Why?” the reasons become more complex. There may be a history of maltreatment or bullying or it may be a temporary falling out (a continuation of an argument from the previous lesson). In this case, heightened emotional sensitivities are an impediment to learning. This is the way things are

but not the way they should be. However, a solution is harder to find. A child who is 'worked up' needs to calm down in preparation for learning. A temporary separation (or 'time out') may be in order or a policy of 'zero tolerance' towards the bully, although the bully/victim relationship tends to be both complex and shifting. How can mathematics help in this situation? Can mathematics be a calming influence? (A question I considered when developing the central research question, 1.3.) 'The way things should be' is to 'make known' the unknown that the child fears. In other words, stability, consistency, security are required in the learning environment. The classroom has to be a safe place to be, safe enough to explore emotions without fear of ridicule or rejection.

### **3.5 SHIFTS IN EMPHASIS**

#### **3.5.1 Working Research**

If I can now claim to hold a certain position regarding the teaching of mathematics to children with EBD, it is a result of developing my practice through the process of working research. The research is 'working' because it is both part of my practice and outside my practice, created to be examined separately from my practice but also lives within my practice.

The growth of my practice is detailed by the development of my commitment to children with EBD. Progress is incremental although, at times, it could be regarded as decremental regress.

Charting each increment or (decrement) is a complicated discipline. *How* did I notice the shifts – in beliefs, values and practice – as they occurred, upon immediate reflection or

upon later reflection? At each point in time noticing occurs at different levels and understanding becomes deeper at a greater distance. As well as trying to understand the child's inner world, I am attempting to understand *my* inner world by focusing on my feelings and emotions as I reflect. I am searching for a coincidence of worlds. Only where intersubjectivities exist can a place be found for a deeper understanding.

I write later (5.2.4) about what I learned about risk-taking from videotaping a Year 9 class. This example illustrates *how* I noticed in the moment and upon immediate (same day) reflection, which arose from watching the videotape on my own, transcribing in a day and reviewing the videotape with the children and classroom assistant. I watched myself teach in an unobtrusive manner. I watched the reactions of the children, the interactions within the classroom, which invariably involved me. There were few pupil-pupil interactions in which I did not intervene, thereby forcing a triologue. By discussing the transcript with the pupils, we were able to reach a meaning about what they meant by 'fun' in regard to mathematics. Thus I was able to develop a greater understanding of the nature of mathematics as interpreted by these pupils.

### 3.5.2 Messages

Another shift in emphasis came from reading (in 1996) Cambone's 'Teaching Troubled Children' (op.cit.). *How* did I come to recognise that Cambone's message was important for me? The answer can be found in the notes I took whilst reading. He focused on the practice of one teacher as she teaches her curriculum (including mathematics) to young children with EBD. I can compare her practice to my own. On the one hand, the exposition validated my research in highlighting the lack of literature on actual classroom practices. On the other hand, I caught the phrase 'highly improvisational teaching'. It was an affirmation of what I was already doing. I knew that in this phrase I had found resonance

with my own feelings about a restrictive curriculum (eg. 'maths for life') for children with EBD. Part of my message is that they need the opposite: a wide and varied curriculum within which to explore mathematical experiences.

Again, reading the literature and reflecting on my experiences has helped to define my position on what is 'right' for children with EBD. It starts as an instinct and ends as an integral part of my pedagogy. What appeals most to the emotions is transformed through data gathering and reflection into a justifiable position. It is a moral stance, otherwise it is very easy to abuse and neglect the children, not in a physical way but psychologically. This is because interactions with children with EBD are frequently on an emotional level and, therefore, the emotional reaction takes precedence. As Bennathan reiterates (2001: 2), the disruptive child will engender in teachers "extremely negative feelings". In reality this leads to sarcasm and put-downs and feelings of anger and hopelessness (or helplessness). Greater understanding of the child's world can obviate these feelings.

### 3.5.3 The Nature of Emotion

A further shift came three years later (1999) when I started reading literature on emotion. In Lazarus (op.cit.) I found a writer and theorist who expounded a new (to me) way of interpreting what happens during an emotional experience or encounter. I moved to take a different perspective of what was happening in the classroom. Up to that point I had focused very much on behaviour and the mathematics curriculum. I had not tried to understand the emotional side of each child's difficulties. I now had a means of placing myself in the position of the child; it was the beginnings of an understanding of the use and usefulness of *empathy*. Again, *how* did I come to recognise that Lazarus' theory of emotion was an important step on the road to a greater understanding of my practice? I viewed it as immediately applicable to my situation because I was already attuned to this aspect of my



practice and, therefore, the text fulfilled a need to understand my behaviour. By treating emotion as a system, which moves through various stages, starting with *appraisal*, Lazarus allowed me to connect with his theory on the level of the practicalities of classroom encounters. Practical applications are important when judging the utility of a particular theory. I recognised the defence mechanism in my behaviour. I understood why I felt threatened by the children I taught and why I was caught in a cycle of negativity. I saw that it was vital that I break out of that negative cycle if I were to move my practice forward.

### 3.6 RESEARCH DIARY

I am aware that I have already presented extracts from my research diary prior to discussing this as a method. The diary contains my immediate recollections of lessons and events, usually recorded at the end of the day. Obviously, I omit what I do not remember. I have no problem recollecting what was said, only sometimes the sequence of sentences. As I am aware that I may want to recount what is said in lessons, I am particularly attuned to my own words and the pupils' responses and questions. The fact that I remember what was said infers that it must be significant in some way, although I may not be aware at the time of its significance to the development of my thesis. Therefore, what I do not recall must be insignificant.

Sometimes an incident becomes significant in the writing up, sometimes on reflection. Also, some events have their significance determined beforehand, such as the experiment with pupil diaries (3.8.3). Experiencing a 'feel good' lesson is significant and, in the writing, I attempt to understand why the lesson was successful (eg. 4.2.4 Stress and Stimulus). In contrast, a particularly stressful lesson is significant and, in the writing and reflection, I attempt to account for this. The following incident also raised questions for me about the consistent application of behaviour management strategies.

16.7.96, Year 9 Maths, Mardell School

Kenneth was being a pain as usual. I settled the others to their work, although Kenneth tried his damndest to get them off task and to muck about with him. He repeatedly refused to follow my instructions – he was doing a chapter on angles and bearings and had worked out one angle as  $310^\circ$ . Every time I went back to him, he still hadn't written it down. He had his name up (quite late in the lesson for him) for name-calling to Tobias. I put a tick up because he still wasn't writing. He got annoyed at this and threw the angle-measurer, which hit Ian. Kenneth got another tick for that (2 minutes detention) and he blew, throwing his books on the floor, which got another tick and 5 minutes. He got up and started walking out, calling "Bill, you coming?" but Bill didn't want to. I said, as Kenneth was standing at the open door, "Just sit down, Kenneth" appealing to him as I could sense that he wasn't really angry. He walked back to his place saying, "I can't be bothered to go anyway."

He still wouldn't get on with his work, though. I can't remember exactly what led up to this but he was 'pen-fighting' with Ben and got a tick for that and Ben his name on the board. Whatever the reason, the last tick he got (10 minutes' detention) he said to me "Fuck off". I walked over to his table, leaned over in front of him, firmly stating, "No", staring him straight in the eyes. He didn't know what to make of this and I could see his eyes changing from amusement to worry to "I definitely don't like this."

"Go away" was his next reaction. Again I said no, still staring at him. The others had turned round and were watching, amused. Then he got really worried and

appealed to Bill, "Get her away from me!" Bill said, "No chance – *I ain't touching her!*"

Then I moved away because he needed a senior teacher for swearing at me. As I went to the phone, Kenneth got braver and started calling me names. His behaviour got worse – he took the classroom assistant's pen and swore at her – so I put him on a severe. Mr I came and took him out.

Later, I saw Mr I in the office, who said that he didn't get anywhere with Kenneth and I described the incident when he told me to fuck off and I said no and he and the office staff burst out laughing. Mr I said that he didn't give Kenneth any extra detention time but spoke quietly to him about how childish it all was.

Earlier, Mr I had said that I had set myself a very difficult task coming in so late in the year (April) but it would get better. He said those boys would push me to see how far they could go until they realised this was pointless and then back off.

26.7.96

I'm thinking about the difficulties of interpreting behaviour consistently. Can you do this when each behaviour takes place in a different context and it is the context that determines the severity of the behaviour?

The early diary extracts illustrate how concerned I was with behaviour, using the diary as a forum for debate, to raise questions but not necessarily to find answers.

### 3.6.1 The Purpose of Diarising: An Overview

At the time I conceived the diary (April 1996) I was motivated by a desire to

- i) record the new experience of teaching in a school for children with EBD and
- ii) provide an opportunity for reflection.

The diary covers several volumes analysing experiences at three different schools and charts the development of the research over a period of four years. In this way the diary acts as the foundation underpinning other methods of research, such as interviews and individual studies.

Initially, the accounts in the diary were of critical *emotional* incidents relating more to behaviour management than mathematics. It is fair to say that before this time I had not been conscious of the place of emotion in my classroom. I had been aware of my emotions but ignorant not only of the pupils' emotions but also of the effect of my emotions on the pupils. I know that on a particular day I would not be sympathetic to entreaties from the pupils to grant an extension on homework (for example). Of course I was aware of the display of extreme emotions from certain pupils but it was something separate from the learning process that had to be dealt with on its own, with the mathematics playing an insignificant part in the emotional incident. By September 1999, after 3 years of researching emotional and behavioural difficulties, I had become aware (from my reading on the literature of emotions) that each child presents an emotional state at any moment in time and that I had to work with (or through) this in order to teach effectively.

The entries tended to be lengthy as I was trying to make sense of the school ecology (and my place in it). The frequency of entries varied - in the first four months I made seventeen entries. Each incident was interpreted for the insights it could provide into the motivations

of the participants (particularly my own as teacher-researcher). I chose to write about teacher-pupil relationships as structured by the behaviour management system, Assertive Discipline (p.6). Later the diary was scanned for emerging themes, once in 1997 and then in 2000 (Ch.5 Themes).

By 1998 the diary was being used in a more discriminatory way to answer particular research questions and to plot the development of relationships with particular pupils. When reflections produced certain hypotheses or conjectures, the diary was used to note evidence, either for or against. There were attempts to try out new ideas or strategies and to identify the conditions for success. Also, during early 1999, the diary was used to evaluate actions that I had chosen to take in the classroom in an attempt to improve the management of mixed ability classes and therefore the quality of teaching and learning (3.7 Action Research).

During 1999 the diary provided data for a more detailed study (at Breesdale School) of two pupils who were encouraged to complete their own diaries, at first on paper and then on audiotape (3.8.3).

By 2000 the diary reflected the shifting focus of research to consider issues of self-esteem and responsibility for learning.

I will now concentrate on how such shifts occurred and *how* the diary was used either to record the shifts or read to recognise the shifts.

### 3.6.2 Reflecting on Practice

Mardell School Diary, 13.7.96,

I believe that the behaviour is learnt – we know that they can behave well, therefore they choose not to and the question is, how to get them to *choose* to behave well?

One answer is the token economy but there are not enough incentives at the school - it does not pay to be good, they get more of an adrenalin rush out of being bad. When I asked Lucy why she had to keep getting into trouble she said, "It's more fun". The merit system does work but it is not enough to keep their behaviour good all the time and the detentions are not enough of a deterrent to stop them behaving badly.

[At Canfield School senior staff organise trips out for those averaging 3.1 and above on the merit system – the child receives a score from 0 to 4 for each lesson. This appears to be a more effective 'stick and carrot' approach.]

I have the impression that classroom assistants are stricter than the teachers and will often take over the classroom management, telling kids to sit down, not to speak that way, etc. I call them 'honorary teachers' because half the time they are required to sit by individuals and help them do their work. They have always had a say in the running of the school but lately they appear to have become *more* equal with teachers - they have grown in confidence and apply the system more rigidly than we do. It is almost like

their main concern is behaviour but, as a teacher, my main concern is the teaching and learning and sometimes preoccupation with behaviour gets in the way of this. You know that if you go straight to the board with names it will disrupt the whole lesson and nothing will get taught, so sometimes I'm prepared to give the youngsters an extra chance. Sometimes I ignore a swearword if it's not directed at anybody and it's below the general noise level. We have been told that we can use other means – 'normal' teacher methods - to get children back on task if the problem is just talking or mucking about. However, normal methods only work if teachers have an effective back-up system of consequences.

The above extract is an example of how the diary was used to record shifts, in particular the acknowledgement that it does not pay to be good and that my main concern is the teaching and learning. Later will come a shift away from this narrow view of my practice towards a concern with emotion. The shift occurred as a result of asking a pupil why she continually misbehaved but I did not recognise and mark the shift until I wrote in the diary.

Did these reflections change my practice in any way?

In my former mainstream school, the 'normal' methods I used were maintaining a distance between teacher and pupil, looks of disapproval, verbal warnings, keeping a child behind for a private word, among others. On the whole, behaviour management did not detract from my ability to teach. In an EBD school, behaviour management has a necessarily high profile and can conflict with academic objectives. After re-reading the diaries, I realised that I was preoccupied with behaviour. Reflecting upon school experiences enabled me to recognise discrete events that I could label *teaching* and that were separate from those events where I was managing behaviour. Of course, the two are not always separate. In

fact, the reflections made me determined to find methods to avoid or prevent bad behaviour rather than wait for it to occur.

I believe that mathematics can be a preventative measure in itself. I came to this knowledge by hearing about how pupils behaved in other classes from teachers and classroom assistants. I realised that certain pupils were better behaved (in general) in mathematics lessons than in English lessons, for instance. From this realisation I asked the question, “Why is mathematics more accessible to pupils with EBD?” I was unsure how to proceed but I knew that there had to be a way of influencing positive affect. This way pupils would choose to behave well as it pays to be good in terms of raised self-esteem. I learnt more about my role as a teacher by taking the time to reflect - albeit superficially at first – critically about the thinking that may have helped to create a problem. I had to consider that I could be a vital factor in pupils’ accessibility to mathematics. In fact, I believe that it is the management of behaviour *through* the teaching of mathematics that made the difference from other lessons.

### 3.6.3 Critical Incidents

The critical incidents identified early on in the research stand out as highly emotional ones, which sparked an emotional reaction in me. Incidents can be identified as critical if they provide insight and challenge beliefs. Developing critical attention provides a transition from reflective practitioner to researcher by turning significant incidents into research questions (Lerman & Scott-Hodgetts, 1991). Mason (1994) states:

“The pursuit of the question of what makes an incident critical by any one person or group of people in a sense constitutes their research programme.” (p.98)



In short, my research programme can be summarised as taking more personal responsibility for the behaviour of all parties in my classroom by showing greater sensitivity and empathy in my relationships with the children. This links back to my central research question (1.3.5) *The development of my practice as a personal journey.*

The following diary extract provides evidence of the use of empathy in my classroom. (My interpretation is in bold letters.)

16.10.96, Sam, Year 11, Mardell School

Sam said he was thick today because he couldn't do 12-7 in his head. He said: "Seven. No, six. No – I can't do it. I'm thick. I don't want to do this anymore."

**I did not respond to these answers – that is how he knew he got it wrong and then got frustrated. His comments are typical of Sam and other pupils in the school and reveal characteristic low self-esteem.**

I said, "You can't be thick Sam, you've done all these questions. Someone who can do all that" – I swept my hand over the page – "can't be thick. No, you've just got a mental block on that question. When I was younger I had a mental block on 9x8. I could never do 9x8. Then I realised it was 8 less than 10x8 so I used to work it out like that."

**He soon got bored by my little homily – and I'm not sure he understood what a mental block was. I was trying to show empathy with him; show that I could understand what he was going through.**

“Right. So what’s the answer?”

**For Sam it is important to get the answer and to get the answer right. That is why he wasn’t interested in listening to my experiences, he just wanted me to tell him the answer so that he could get on to the next question.**

I got up and did it on the board.

“Take 2 off the 12 first of all. That leaves 10. Then you’ve got 5 more to take from the 10. That leaves 5.”

“So the answer’s 5?”

“Yes.”

**I was trying to teach him a strategy for subtractions he did not know. As he did know the answers to the other questions I tried, I wasn’t able to test him out.**

Sam wrote it down. We did six more questions and I continued to reinforce – “Yes, good” – when he got a question right. When he finished I said “Excellent. Well done.” Then I went back to the question that had caused him the bother. I said:

“It was just 12 take 5 wasn’t it?”

Sam said, "12 take 5? That's 7!"

"Yes. You can do it now."

"Yeah, I can do it now. But you said 12 take 7. That's harder."

"Yes. I did, didn't I?"

He laughed. "I don't know why I couldn't do that."

**I accept that 12 take 7 is harder because 7 is a larger number to take than 5 but my assumption was that 12 take 5 and 12 take 7 were the same thing. If I know that 12 take 5 is 7 then 12 take 7 must be 5. But why didn't Sam?**

I am sure that I could have been more empathic but that was an early example of an attempt to get behind the child and use praise and encouragement – *and* the boy's own success at mathematics – to draw him back to a point of difficulty.

Each critical incident can be seen as a shift in itself. The following extract illustrates a critical incident, which challenged my beliefs and advanced my research programme, by providing insight into my motivations.

19.12.96, George, Year 9, Mardell School

George came into maths obviously upset over something that had happened in English - it later transpired that he had lost his changeover [merit] and Ms

M had "torn his record sheet". I tried to settle the other two who were roaming around the room - I kept asking them to sit down. David asked what we were doing today but I said I'd tell them when they settled down. They did so but George wasn't settled. Mrs X [senior teacher] crouched down beside his table trying to get him to calm down and speak to her. He had his head down on the table resting on his arms. I know she was trying to persuade him that he had done really well and only lost one merit. He wasn't responding so she walked out.

Shortly after Mrs X had left, George leapt out of his chair, ran up to my desk, snatched his record sheet up, glared at me angrily and snapped, "I'm going" and made for the door. The other two immediately chorused, "That's a severe", which is their favourite chant if they want to get someone into trouble and I admit to hesitating for a split second then saying, in confirmation, "Well, yes it is". [A severe meant an automatic 10-minute detention and removal from class.] George yelled from the door, "No, it's *not* a severe. I'm calling (Mrs X)!"

He was the other side of the door with the door ajar and yelled her name twice but she had gone by then.

The rest of the lesson was taken up with a protracted argument between George, the Deputy Head and me about whether George had broken any rules. He knew that leaving the classroom without permission was a severe. We argued over intention and deed - did he intend to leave and did he actually leave the room? The atmosphere remained emotionally charged because George became more and more upset but I felt at the time that it was not my responsibility to deal with him as I had a class to teach; I was not to blame for his

feelings. My overriding concern was not to lose my authority; I had to show that I was in charge. These were my motivations.

The reflections represented a shift in my realisation about the sphere of my responsibilities.

Reflecting on the incident challenged my belief about the traditional teacher-pupil relationship; above all I had to be in control. My immovability aggravated the situation and created an unnecessary conflict that meant a wasted lesson for this pupil. By disowning responsibility for George's behaviour, my actions created the problem and left me feeling much the same as George: frustrated, angry, dissatisfied and irritable.

From this incident (or rather, arising out of writing about this incident) came a desire to show greater sensitivity and empathy for the individuals in my classroom. It is only upon reflection that I realised that greater empathy on my part might have redirected George's torment. As a teacher, I have the ability to consider the wider picture and not become obsessed with the pedantry of a particular form of behaviour management. My aim became to maintain stable relationships in the classroom in order to prepare the students for learning.

#### **3.6.4 Development of Teacher-Pupil Relationships**

The above example concerning George illustrates how relationships were initially structured by Assertive Discipline. To a certain extent relationships tend to be shaped by the exigencies of behaviour management but the rigidities of AD often dominated proceedings.

I believe that teacher-pupil relationships are crucial to the teaching of mathematics (or

any subject) to pupils with EBD, even more so than in a mainstream school. This belief arose from the intense nature of relationships in the EBD setting, the physical proximity of the pupils and the direct influence that I could have upon each child. However, I only recognised the crucial nature of relationships after I had gained the trust of the pupils. Therefore, it was only through developing actual relationships that I could perceive their importance.

### Example 1

The nature of Mardell School at this time (small in numbers - about 40 children - and in size of building), all housed in one building, made it easier to communicate regularly with the pupils. The staff also shared break and lunchtimes with them. Whilst writing about critical incidents, I found that I was charting the development of relationships as I was drawn to write about certain pupils in the same way as I was drawn into certain relationships. This was mainly because a particular pupil drew me into their inner world - into their way of thinking and being. In the short period (the Easter holidays 1996) before I started to teach at Mardell, I considered how to motivate, interest and engage the pupils. I was concerned mainly with the type of (extrinsic) reward that would be appropriate for the pupils. However, after I started at Mardell, I began to think about teaching mathematics in a different way that had its own intrinsic reward and was more about relationships, more about how *I* affected their behaviour.

How did this shift occur? My initial image of the pupils was not based on experience of teaching them, only of what I had seen on visits and what I had read in books on special needs. Concentrating the research on how I affected their behaviour was a result of experiencing the intensive nature of relationships in the classroom. I had a crucial role to play in providing opportunities for success for the pupils. The shift represents a

development in my practice as a result of trying to affect relationships in the classroom (a point made in 2.7.3).

From here it is a short step to examining how the motivations of the teacher and the student interact in such a way as to affect the quality of learning (2.6.4 Summary). The following diary extract illustrates such an interaction.

Diary Extract: 10.10.96, Ben, Year 10, Mardell School

I explained to Ben what to do with the SAT question. He had some difficulty working out  $y$  for negative values of  $x$  because, as I realised when I worked through them with him, he did not know that a minus squared was positive. (He worked out 1.5 squared in his head, which surprised me.) He changed his answers accordingly.

Then I explained the next part of the question, that he had to find the value of  $x$  between 1 and 2 for which  $y=0$ . He very quickly found the answer 1.8 with only 2 trials. I then gave him another similar question, although I asked him first if he wanted to do another one. He said, "I suppose so". This was  $x^2 + x - 3$ , which he managed with little help from me.

I then got his book, Y1 (SMP, 1985). He had done some algebra from the book before so – I had not prepared this – I found some work at the back on brackets and asked if he'd multiplied out brackets before. Ben said he thought he had and asked which one I wanted him to do. Rather than reading through the book's instructions, as I did not like the way they set out the method in a table, I showed him the way I had been taught to

multiply  $(p+3)(p+3)$ . He cottoned on to this really quickly and copied the method for  $(p+2)(p+2)$  so closely that he put 9 at the end!

The actual questions in the book were harder though and I started to explain  $(4a+3)(4a+3)$  but he said, "No, no – I'll do it". First I noticed that he wrote down  $4a^2$  and I said he had to do  $4 \times 4$  as well: "What is 4 times 4?"

"Sixteen."

"So change that to  $16a^2$ ."

Ben did but then he carried that with him and wrote  $+16a \times 3 + 3 \times 16a + 9$ .

I explained that the sum was  $4a \times 3$ , which was  $12a + 12a$  was  $24a$ . I asked

Ben to write the answer out again. Then I looked more closely at his previous answer and said:

"You've actually got the method right, haven't you? It's just that you wrote  $16a$  instead of  $4a$ ."

By that time it was the end of the lesson. I told them that they had worked extremely well...

In my interpretation at the time I was fairly self-critical but I did (unintentionally) reveal my motivations.



## Interpretation

Although on the surface this was a successful lesson and Ben's attitude was positive throughout, I feel I made errors of judgement, thus laying the foundations for problems later.

First of all, I should have prepared what he was going to do after the SAT question, ie. looked in the book Y1 to see what algebra he still had left to do and to assess the method shown therein. At the time I only gave the method a cursory glance and now I feel that it may have been easier to understand than my method. I made the assumption that because I had learned to multiply brackets in a certain way then that was the best way to teach Ben.

Secondly, the jump from my example to the first question in the book was too great; he should have had more of the easier type to do, like  $(p+2)(p+2)$ . The harder questions caused problems next lesson.

The fact that Ben was prepared to stick with it for fifteen minutes was a mark of his trust in me and his belief in his own ability. We both believed that he would be able to do this work.

Re-visiting this interpretation, I am struck by the way that we are both motivated by self-belief and by belief in one another. I am concerned to stretch Ben with more difficult work in the belief that he can cope with it. Ben wants to show me that he can do anything that I ask of him. This means that neither of us is prepared to give up but I am trying to push him too far too quickly.

Example 2

With reference to one student, David, the diary highlights the way that our relationship developed over two years.

David, Year 9 30.6.96, Mardell School

Last week David said, "You're going out with me aren't you Miss?"

Me (wearily): "Yees, David".

"Can I cuddle you?"

"No, I never hug on a first date."

Next day: "David, pick that up".

David: "Only if you give me a hug - you have to 'cause it's not the first date".

Friday 6.9.96

David has been excluded already. At the end of last term he was a model pupil regularly gaining the maximum 22 merits a day. This term I think he is unsure how to cope with Jed being in the form and he's been very physical, coming very close and flicking his fingers in my face. He was excluded for chucking a pen at me, which hit my face. Mr I's reasoning of the boy is that he's a "power freak"; he has to control. He brings in all sorts of objects, which he knows he shouldn't have, just to see the reaction - he was stealing the bonnet badges from cars at one point. If he hits or hurts somebody he always says he didn't mean to but, as Mr I said, "Next thing you know there's a knife sticking out of the middle of your forehead". It was put down officially as "violent behaviour towards a member of staff",

which will probably be quite a shock to him as he doesn't realise how extreme he's being.

I imagine David will be in early on Monday with his mother, as he hates having time off school. He even came in last term with a bandaged face - the result of riding his bike through a plate glass window - though he would have been better off at home.

#### Wednesday 9.10.96

David claimed that Damien had hit him on the arm. To demonstrate this he hit me on the arm hard enough for it to hurt. When I started to write his name and a tick on the board he reacted by shouting angrily and violently pushed his table from where he was sitting into the table in front, knocking it over so that it fell against me, scraping my leg. He felt aggrieved, as I would not put Damien's name on the board because I had not seen Damien hit him.

#### Friday 20.6.97

David took out a deodorant spray from his PE bag and started spraying it around. Ms A [classroom assistant] asked him to put it away and I confirmed that he'd have to hand it over. His name was on the board for swearing but he was also abusive to Ms A so I put a tick both for the abuse and for using the spray. He asked angrily, "What have I got a tick for?" I was facing the board when he sprayed the back of my head and I immediately put an 'S' (for severe) on the board. I felt suffocated and I was not listening to what

David was saying. I went to the window and opened it to let some air in, noticing that Damien looked quite shocked.

Freddie then said, "David, you realise breathing that stuff in could harm the baby" [I was seven months pregnant at the time]. I panicked and knew I had to get outside into the air but as I made my way to the door [past David, the Deputy and Ms A] David made a sarcastic comment,

"Oh, she's going out to cry". I swore at him and left.

Later I said to Mr I that it's when I feel threatened that I 'go', like when someone comes too close physically. He said I'd have to keep David at two arms' lengths, which is probably impossible.

Tuesday 24.6.97

David came back today and was brought to me just before lunch to apologise.

"I'm sorry." He shuffled from foot to foot.

"I'm sorry too." I found this difficult to say.

"What for?"

"For swearing at you."

"Don't worry about it. I'd've done the same."

I sat next to him at lunch. I didn't talk to him much but he spoke to George.

David was good in maths period 6 when I videoed him and Damien.

Monday, 2.3.98

Felt terrible today. David spotted this first thing and asked why I was moody. He said I must have woken up next to the wrong man. I took away his language tick for being cheeky.

There is circularity to this relationship; it started light heartedly and ended the same way but in between it was quite extreme. I did not realise that the 'story of the relationship' was there until I re-read the diaries. The story illustrated the development of a relationship that changed in intensity over time. I can now see the shifting power base in our interactions.

The task in analysing the diaries became one of drawing out the story of the developing relationships and how they informed the story of the development of the way in which I taught mathematics.

### **3.6.5 The Process of Questioning and Conjecturing**

The issues raised by teaching children with EBD prompted questions, which revealed the dilemmas inherent in managing behaviour.

26.7.96

To what extent do the teacher and the classroom organisation influence the behaviour? Behaviour is a function of two factors - personality and situation - so what we are trying to do is remove the situation and see it as separate from the personality. However, personality traits can predispose a person to react in certain ways.

It is the pupil's response to the teacher and the classroom organisation that determines behaviour. I came to this knowledge by trying to identify in the diary those moments when I had clearly caused deterioration in behaviour as well as those times when I contributed to a happy atmosphere. This illustrates how the diary was used as an effective instrument over time.

25.8.96

I have a feeling that the successful lessons are the ones wherein I do not allow emotions to become heightened or, for whatever reason, they do not become heightened and the children are completely involved in the mathematics (so much so that they forget they have EBD). Even when they are involved in a practical experiment and being creative coming up with ideas and suggestions, they go about their business in a calm way and do not become over-excited and concerned with relationships. Is this because they feel valued in themselves and are engaged in a valuable pursuit? Perhaps not the latter but they certainly do not feel devalued in any way. I think it is because they feel comfortable in the connectedness they feel with the activity or task.

I think of Owen happily engaged in calculating proportions. Even though he was not sure about some questions, and did not get them all right, this did not put him off. I can also remember Neil and Sam measuring the weight it took to break different lengths of spaghetti. The situation was not stressful even though some things they tried did not work, such as the size of weighing basket to put the weights in. We were all engaged towards a particular goal.

Spring Term 1997

In the first week watch out for situations where I am made to have a feeling that might belong to the person with whom I am interacting.

9.1.97. Year 10, Frank

Frank was getting frustrated at not understanding what he had to do to fill in the factors sheet. He had successfully worked out the factors of 12 but could not see how to put them on the sheet.

I asked him, "What two numbers do you times to make four?" He kept saying, "I don't do *times* – I'm not doing it!" No matter what I said, he just kept saying, "I don't know what I've got to do!"

"I'm trying to explain it to you but you won't listen."

I said to Frank, "What sum will make 4?" He could not answer so I asked Quentin, who said, "Four ones". He also offered "two times two". I sensed Frank's frustration that the others were finding it so easy. I certainly felt, well if they can do it Frank should be able to.

Rather than give up, I asked Ms A [classroom assistant] to explain it to him. She knelt down beside Frank and, in a quiet, soft voice, first explained that you had to shade all the ones and all the numbers because one and itself will always go into the number. He asked, why one? She said, "Well it doesn't matter how many ones you've got". He seemed satisfied with this

explanation. She went on to do a few for him – “Two goes into eight and four goes into eight”. The difference to my explanation was the “goes into”.

This is an example of me being made to feel the same as Frank, ie. losing patience, frustrated, short-tempered. He couldn't understand me and I couldn't understand why.

### 31.1.99

How is behaviour (good or bad) reinforced in my classroom?

This is the same question as the one I was asking in July 1996 when I was considering the influence of the teacher and classroom organisation. However, in July, I was viewing the question from a systemic perspective; the behaviour management system (Assertive Discipline) functioned to simplify and structure relationships. At the time I used the diary to debate the influence of the system on its members in conjunction with my reading on the ecosystemic approach to EBD (eg. Cooper et al, op.cit., Wheldall, 1992). I could see that the system produced particular patterns of relationships. For instance, the teacher, by applying the letter of Assertive Discipline, can spark off a spiral of increasingly negative behaviour in both teacher and pupil. The pupil misbehaves; the teacher applies the consequences, which are interpreted negatively by the child while the teacher becomes more negative in applying sanctions. This illustrates how re-reflecting on the diary later afforded different insights.

### 11.7.96

Lunchtime. I went up to the board to put a tick by someone's name and as I



moved away from the board, Bill, returning from the hatch wiped a tick from Kenneth's name. I put the tick back next to Kenneth's name and put another tick beside Bill's. As I walked back to my seat he yelled, "No! What's that for?!" Mr I [Deputy Head] seemed to say to Bill that 'someone' had seen him wipe a tick off and he yelled, "Who?" Mr I came over to our table and asked who had seen Bill rub the tick off. I didn't get a chance to say anything because George replied immediately, "I saw him". So Mr I went back to Bill and said, "George saw you do it". In retrospect not one of his brighter moves because Bill flew out of his chair and went for George with his fist up and arm drawn back and had to be restrained.

I appealed to Mr I, "Can I say something now? You didn't give me a chance to answer the question. I believe I saw Bill wipe his hand over the board." It would have been better if Mr I had waited for me to answer in the first place. George said he didn't mind being a grass and didn't even rise to the bait when Bill called his mum a 'cripple'.

This extract illustrates the difficulties in managing the system consistently and how the children try to manipulate the system processes to their own advantage. The extract provides the context within which I understood the complexities of my role as a teacher-researcher. An attempt to understand the system as a set of human interrelationships gave depth to my questioning and remarking.

On 11 August 1996 I wrote:

The children *work* the system by manipulating the teachers who apply the processes - trying to get them to put their name up when they've been asked to do something and have not responded straight away but then crying out "I'll do it! I'll do it."

The children are also manipulating the teacher's emotions (commonly known as 'winding up').

### Monday 1.2.99

Good behaviour is reinforced with merits and (not enough) praise.

Bad behaviour is reinforced by others joining in and encouraging it.

From seeing the (bad) behaviour reinforced by the system - and the relationships shaped by that system - I came to view behaviour as a social event, which cannot exist without relationships. I reached this view after an intensive period of studying relationships through interviews and studies of individuals. Acceptable or unacceptable behaviour must be directed towards some object, which is then changed in an interactive process. The object is usually a person but can be a group of people or a system.

### **3.6.6 Summary of Research Diary Method**

As stated above (3.6.1) the research diary underpins much of the research that was undertaken after April 1996, including interviews and studies of individual pupils. The diary provides impetus for interview questions and for focusing on certain pupils, as I find myself writing about them (3.6.4).

The diary is a highly personal method of research – I decide which incidents are emotionally significant for me and, therefore, worth describing and interpreting. In that sense, it reveals more about me as a person and practitioner than the subjects of my research. With that understanding, the diary charts the shifts in emphasis of my research: beginning with my experience of a new setting (the EBD school), gradually encompassing

my interactions with the pupils, pupil interactions and then onto a more experimental plane, whereby I use the diary to test emergent hypotheses. One early hypothesis was that mathematics is more accessible to pupils with EBD than other subjects, particularly English. The diary was then used to gather evidence either for or against the hypothesis.

Early emotional incidents were redefined as critical but now they had to provide insight and challenge beliefs. For example, challenging the belief about traditional teacher-pupil relationships caused a shift in my practice towards greater empathy for the pupil. In this way the diary influenced my development as a practitioner.

The diary also acts as a chronological record of the development of relationships – I have illustrated this with the recording of my relationship with David (3.6.4, Example 2).

The diary reveals the extent to which I influence behaviour. It also provides an opportunity to re-reflect on incidents, thereby giving further insights into behaviour.

One use of the diary is to record the effect of changes in practice on the subjects of research, ie. a form of action research.

### **3.7 ACTION RESEARCH**

#### **3.7.1 Initiation**

I first came upon action research about a year into my research. My initial impression of it (as expounded by McNiff, *op.cit.*) was of a clinical approach to research, which had no room for deviation or individualisation but followed continual cycles of planning, acting, observing and reflecting, replanning etc. I felt that action research must have a practical

application to my classroom and so I implemented different *actions* and evaluated the results.

I was only able to conceive of action research in an educational context, although later I came to realise that this was a narrow concept of action research, which in reality is a ‘broad church’ applicable to different disciplines. I believe that I was intimidated by the advocacy of action research as promoting change for the advancement of teachers, pupils and educational theory.

“Action researchers are intent on describing, interpreting and explaining events (enquiry) while they seek to change them (action) for the better (purpose).” (McNiff et al, op.cit: 13)

By reflecting on my own practice, I identified a problem and decided upon an action designed to solve the problem. I intended to observe how students reacted, evaluate the outcome and reformulate the problem in the light of my evaluation, considering further action.

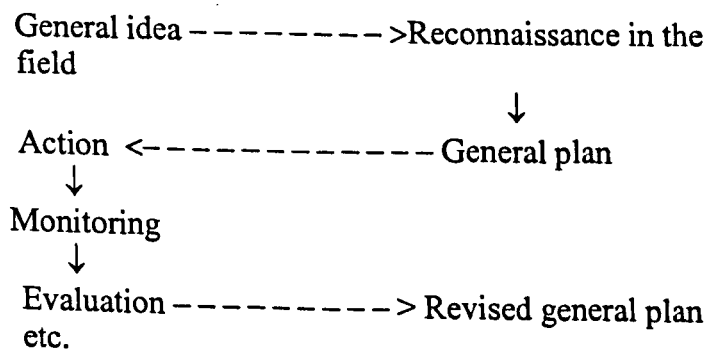


Figure 3.7.1 *Action research spiral* (Kemmis & McTaggart, 1982)

Action

In order to settle them down, start each lesson with ten arithmetic questions, which I have written for them in a separate book. I keep the books so that they will stay neat and they can take a pride in their work.

Evaluation

Only had time to do one per group this week (ie. 10 addition). Some complained they were too easy so when I did 7E's for some of the more able ones I made them harder (by using bigger numbers). Bobby still thought it was easy though.

Diagnosis

1. More differentiation needed.
2. Need to find time to write questions.

Action

Wrote two types of subtraction for 7E Mon 11.1.

Evaluation

1. Some complained that the harder questions were still too easy.

2. There was a problem with the children finishing the questions at different times, meaning that there was not a smooth transition to the next part of the lesson. I did not know what to do with those who finished early except to give out books and ask them to get started without a whole class explanation.

### Diagnosis

1. More differentiation needed.
2. Try a different approach - sit them in (ability) groups so that each member of the group would finish at roughly the same time and I could start them on the next activity as a group.

### Action

On Tuesday 9 February I made 4 groups by pushing tables together and had their books ready on the tables.

### Evaluation

1. Some immediately asked to move when they saw where their books were placed.
2. Nicholas refused to sit in the group where I had put him and went out. Later P [SEN assistant] managed to persuade him to come back but he refused to talk to me.

The cycle came to an end by the summer half term when I had to give up on the

arithmetic because I had changed classes from teaching Set 3 to Set 2, demanding a different approach. Also, writing the questions was too labour-intensive.

I found that, as Otto and Kanga (1995) described, my action research yielded partial solutions and increasingly complex problems. I also agree with Crawford (1995) that action research is about emotional involvement:

“Emotion and motivation have traditionally been considered as separate factors with either an additive or causal relationship to thinking and behaviour.” (p.240)

Action research is by definition self-reflective and, therefore, must produce a change in sensitivity in the researcher to the possibilities that arise during research. For instance, I can help others less confident in teaching mathematics to develop their practice. The consequences of the action taken will determine the value of that action. For me, in the examples above, the consequences did not justify the action and led to the cessation of the action research experiment, as I saw it at the time.

I then became involved in observing two of the boys. My attention had moved away from initiating actions towards observation and questioning.

### **3.7.2 Research Community**

At the heart of action research lies the ‘double dialectic’ of theory and practice on the one hand and individual and society on the other. It can be resolved by a self-critical community of action researchers committed to the improvement of education. However, I was uncertain of my place in this community – is it that being a researcher automatically

places me in a research community? I believe that this is so and that the fundamental principles of action research relate to my overall practice enquiry.

*Critical action research* brings in an element of social justice - how can the situation improve (in terms of social justice) as a result of researching it? Another outcome should be the improved professional judgement of the teacher. Most skillful and experienced teachers make decisions of an instant and practical kind every day. Most also reflect on incidents subjectively in order to justify judgements made. However, *diagnostic* judgement is difficult to achieve as it means a conscious understanding of the nature and effects of practical (instinctive) decisions. To take this a stage further, specific hypotheses can be formed from the data, leading to further investigation. Critical judgement challenges and evaluates judgements and values revealed by reflection.

A very early example in the UK was the Ford Teaching Project (Elliott & Adelman, 1976), which aimed to help teachers gain greater control and autonomy over their own performance in the classroom. By reflecting on their own practice, teachers could test ideas and make a contribution to theory. Action research would contribute to the understanding and solution of the practical problems faced by teachers in the classroom and to the development of a theory of teaching - in this case, 'inquiry/discovery learning'. However, the research found that self-monitoring threatened teachers' self-esteem; they found it difficult to make classroom problems accessible to each other. I have found that in a different context, ie. a school for children with EBD, I have become more aware of myself and the situations in which I find myself. This is because the greater volume of classroom problems – and the consistent nature of problems across the school – makes it easier (I would say compulsory) to monitor behaviour.

Validation comes from involving others in making judgements about the research,



either participants in the social situation or co-practitioners engaging in a shared discourse. Participants should enjoy free and open dialogue during the process of research in defining problems, raising hypotheses, developing a plan of action and evaluating the implementation of the action steps at each cycle. In this way theories are validated through practice rather than being validated then applied to practice (McKernan, 1996). I have attempted to test hypotheses through my practice, sharing in a discourse with other researchers at conferences.

I started using triangulation as a means of validating my research. I used this method in viewing videotapes with students and the classroom assistant at Mardell School in order to elicit different perspectives. This had the advantage of forcing me to re-evaluate my interpretation of events. In other words, it advances reflective practice. I have also used methodological triangulation, bringing various research methods to bear in examining my classroom, eg. interviews, studies of classes and individuals and observations, focusing on the same subject.

For me, validity constitutes the faithful representation of the participants' views and feelings in my written observations. This is why triangulation is important, as a check and balance for the writer's assumptions and conclusions. Participants have the right to reply to my interpretation of their views. Presenting a video to the participants is one way to provide an opportunity to discuss and debate what is motivating said actors and to expose alternative interpretations that can be placed on their actions. (For a further discussion of validity, see 3.9.)

### **3.7.3 Extending the Concept**

My engagement with action research is basically experiential. Although I know that

action research is to be found in different arenas (eg. business, local government) they are linked by the iterative nature of the process. I have failed to engage with the action research spiral. However, I can say that I am developing my practice through researching my practice and thus can associate with the dynamic nature of action research and its principles of social change within the classroom.

I can illustrate this assertion by outlining my response to part of an article by Elliott (1987) on educational theory, practical philosophy and action research. In it I read a discussion of the bases for educational theories. These pages contain an elucidation of a debate about how to critique the belief structures that underpin practical theories (as held by practitioners). Using current practice and the knowledge and beliefs of the practitioners as a starting point, questions can be asked from a philosophical, psychological or sociological standpoint. In the sense that I understand what I have read, it is too abstract to further my knowledge of my practice or what I can do to change my practice. In other words, I utilise action research (as outlined by Elliott) as a theory of practical application when change is desired rather than a theory of practice enquiry.

Lomax (1999) advocates a new discipline of educational enquiry encompassing educational action research, living educational theory and practical educational knowledge. This innovation moves my understanding forward through the new discipline of *self study*, which I regard as a significant discovery for me. Self study and self critical reflection define my own research approach in that I am investigating my own practice, reflecting on it, learning from those reflections in order to recognise shifts in the way I interpret my practice.

The development of my practice has resonances with Whitehead's 'living theory' (1989), which results from accounts of an individual teacher's educational development. I can

express my theory in a propositional form: “*If* the teacher does not reduce the challenging nature of the classroom *then* emotional and behavioural difficulties will not be reduced”. However, in Whitehead’s view, this masks the living form. In this case my theory is better expressed thus: “How have I reduced the occurrence of EBD in my classroom?” Answer: “By reducing the challenging nature of the classroom”, which leads to more questions and answers to elaborate my theory.

For Whitehead, teacher-researchers evidence a *living contradiction* – watching myself teach on videotape provides examples of my values and also, the negation of those values (otherwise there would be no need to improve or develop my practice).

Figure 3.7.3 places my theory in a clear tradition within the umbrella of action research.

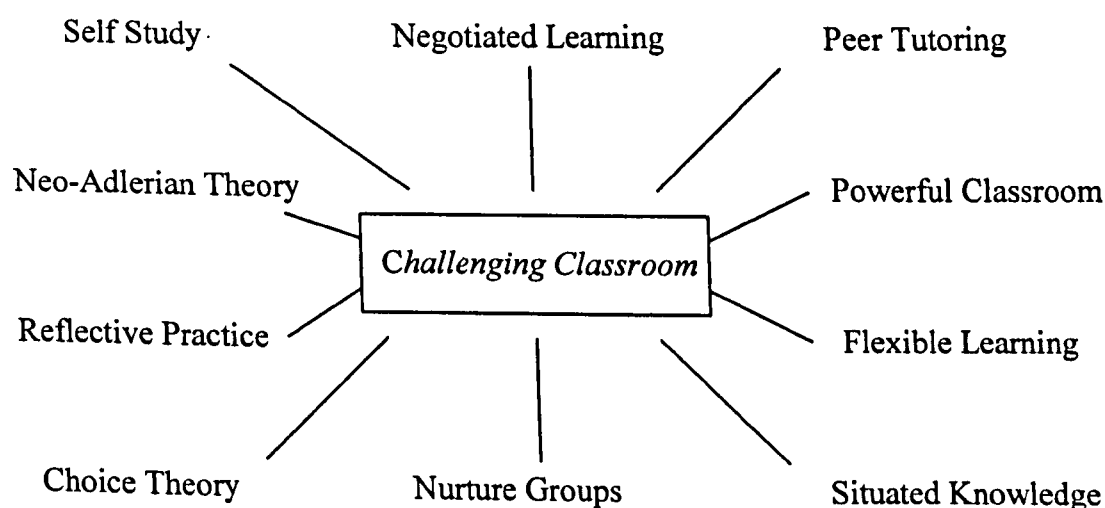


Figure 3.7.3 Theoretical Framework

### 3.7.4 Conditions for Successful Action Research

For action research to be successful in the context of my teaching it would need to improve my practice, improve my understanding of my practice and improve the situation in which

I practise (Carr & Kemmis, 1986). Although I did not follow the action research pattern to the letter, a consideration of how I, in consultation with others, could improve my practice to the benefit of all is a useful and necessary process.

Improvement is a noble aim but if action research is to be accountable it is a complex and prescriptive procedure. By this I mean that many stages involving some or all of the participants are envisaged before the process can be deemed complete. McKernan's (op.cit.) model involves parents, teachers and pupils in whole-scale curriculum planning. In the first cycle, their task is to identify and define the problem and the constraints (internal and external) that impede progress and rank them in priority. This should produce hypotheses for testing in practice. Developing an overall plan of action, including roles and meetings, is the next step. The time involved in convening such a group of people, who then have the right of free discussion and debate before decisions are agreed upon, will be apparent to anyone who has served on committees.

Implementation of the plan is followed by evaluation of the action steps by the 'critical research group' who seek to understand the effects and may set in process a second cycle of research. For a school, this amounts to a long-term commitment to the democratic instigation of change.

### **3.8 THE DATA SELECTION PROCESS**

In approaching the selection of data, I sought out groups of individuals linked by common factors, in my case, age and class group. This suited a grounded approach towards data collection and analysis wherein the conceptual framework emerges after a period of time. I found it necessary to form a conceptual framework to relate the main features of my study and determine the data to be collected. Once a substantial amount of data had been

collected, I was at liberty to review the framework.

### 3.8.1 Conceptual Framework

I developed a diagram (in 1999) covering the main aspects related to my study as a way for me to clarify the complex interrelations of my research. The research framework was drawn originally as a 'flow of consciousness'. Though complex, it enabled me to make connections between certain parts of the framework. However, it proved to be unwieldy and unhelpful as a tool for examining my practice. In its place I devised Figure 3.8.1 to cover the main research areas.

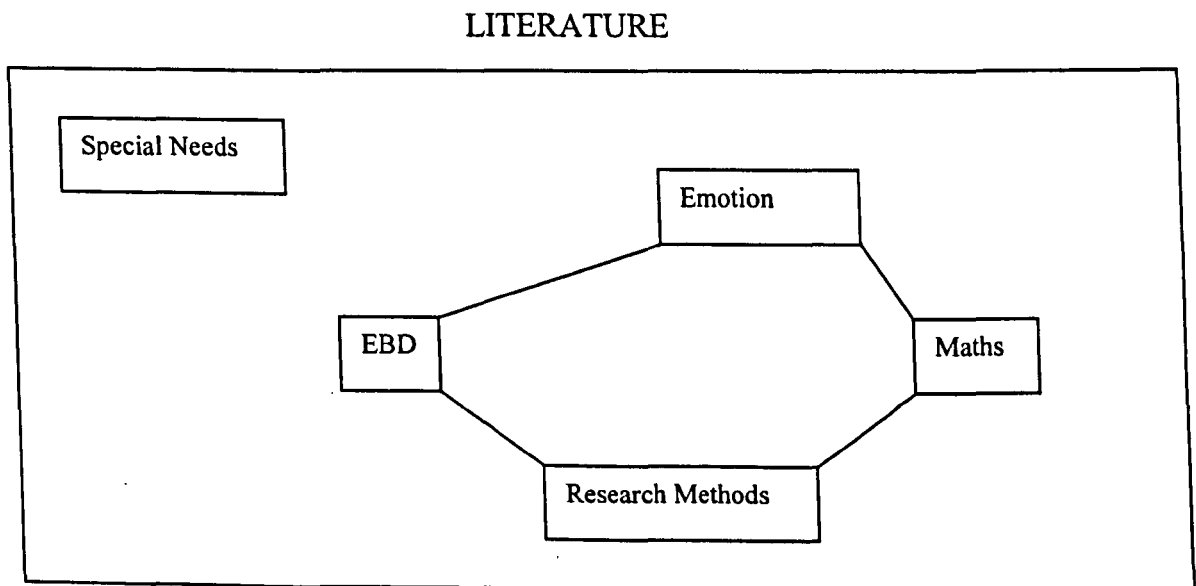


Figure 3.8.1 Main Research Areas

I have kept the areas separate as they rarely overlap – for instance, literature on teaching mathematics to children with EBD. However, the intention of reading in these areas is to synthesise the literature on EBD and mathematics. I chose this particular representation of my conceptual framework in order to simplify the links between the different areas.

Another layer to the diagram would provide more detail. For example, within EBD there is

a wide literature on behavioural theory: within Research Methods, literature on action research. The conceptual framework is a surface map, which covers the main concepts under study. It is a way of referring to my research. The key to the utility of the framework lies in its capacity to apply to different frames of reference. For example, I could view my practice through the lens of mathematics or emotion. Reflecting on my values provides the opportunity to question classroom assumptions and, possibly, reframe my beliefs. For example, in the sphere of equal opportunities, I believe that each pupil has the right to a safe educational environment and to equal attention from the teacher. Therefore, it is my duty to provide this. In the classroom, however, behaviour may prevent the achievement of these objectives. One of my assumptions is that the mathematics will prevent a lot of disruptive behaviour but in reality it may not. Therefore, my beliefs about equality are contingent upon the accessibility of mathematics.

To elucidate further, the wider literature provides the first layer of the framework. Between this and the next layer of more detailed reading, lies the initial fieldwork. The actual research is ongoing, leading each time to a further layer of reading. In this way, the fieldwork and literature build in layers, feeding each other. (This chronological approach can be seen in Chapter 2.)

### **3.8.2 Choice of Subjects**

I selected the subjects for study in a pragmatic (rather than random) way because the population of EBD schools is comparatively dynamic. Pupils arrive and then absent themselves with alarming regularity, especially the older ones, who feel that school has little left to offer them.

At Mardell School, I chose my own Year 9 form for the following reasons:

1. The benefits to the researcher as a tutor and the ability to help the pupils emotionally and mathematically.
2. The broad spectrum in attitudes and special needs of the pupils.
3. The availability of classroom support.

The class functioned as a vehicle for my personal enquiry, to help tell the story of the development of my practice.

At Breesdale School two Year 7 boys were chosen as an experiment to involve them further in the research than had been done previously. At Mardell School I videotaped lessons and then played the tape back to the class inviting them to explain their actions and interpret the actions of others. However, at Breesdale School I wanted the pupils to take a more active role in the research by being responsible for taping their interactions and confiding their thoughts to the tape. Edward and Graham were chosen from the same class so that they could conduct the research together but mainly because of their special needs within a mainstream school. My purpose was to focus the data gathering process on a particular class or individual. This enabled me to analyse aspects of classroom life. Edward and Graham were experimenting with pupil diaries - they had never used them before and neither had I. It was important to empathise with their situation and we did build up a degree of trust by the time the study ended when I left the school (1998-1999).

At my present school, I continued to study my own classes out of necessity as the research continued to be a personal enquiry (Fig. 3.1).

### **3.8.3 Pupil Diaries**

Edward and Graham, who were asked to write about the mathematics they were doing

and how they felt during each lesson, began the diaries in January 1999. I chose these two boys because we felt a certain empathy for each other and I felt that we would be able to work well together. The boys were given a Dictaphone in which to tape their interactions during lessons and to give them responsibility for the taping. The original intention was to use the diaries and transcripts to discuss our (different) viewpoints on a regular basis.

Initially I asked the students to write about what happened in the lessons and how they felt about the work: for example, did they find it easy?

Edward, 8.1.99

Odds and Evans.

Sheet 8:1

It was ok it was challing

and it was about odds and

Evans

Page 170 EX8:2

Graham, 14.1.99

Multiplication.

Well I thought it was quite easy. In

our books.

It can be seen from these extracts that where they were writing about mathematics they did not move beyond the stage of communicating about mathematics - they summarised (ie. copied from the board) but did not show an understanding of underlying ideas or attempt to use mathematics to communicate.



I had hoped that the diaries would gradually reveal their thoughts and feelings. In trying to record what was actually happening for Edward and Graham I did not anticipate their interpretation of the task, which was basically getting it right for the “University people”. Our aims were different: I wanted to find out their feelings about the maths; they were keen not to be judged by strangers as ‘stupid’. The question raised at this juncture was how to develop the diaries beyond this stage to a point where we had more to share without being too prescriptive.

Tuesday 26.1.99

Edward

I feel stressed and annoyed and

I don't want stay in the classroom

Graham

Felt bet bad. done no

work (some) because

room was noisy.

Here the boys are writing about negative emotions. I wanted them to write about their feelings and they did but not their feelings about mathematics. As a result, I decided to ask more specific questions in order to focus the diaries more. As they did not like writing very much, I asked them to tape their diary at the end of a lesson when they had been re-taking their Year 7 exam. Edward and Graham did this in a separate room out of my hearing.

March 1999

G This is Edward and Graham's diary. Well, this is what I thought. I thought my test was shit and it had lots of fucking - all sorts of shit on it.

E I thought it was totally crap and I don't know what the fuck it - I don't want it 'cause it was so shit. I had to skip a page and a whole nother page and all that fucking load of crap. Yeah, see? [said in a rapid voice]

This was the tone of their 'diary'. Obviously it was a bit of mischief to swear on the tape but their real anger and hatred at being forced to do something that they could not do (ie. the test) comes through, with each trying to think of the worst language they could use on the tape.

Subsequent interviews reveal an anxiety directed towards certain individuals in the classroom.

Interview with Graham, 12.2.99

G I like maths but not other people.

T So you don't like doing your maths with other people around?

G No. Especially Dean and Nicholas and Dave. And especially the one who's, um, Callum.

T What do they do to you then? Or what do they say to you?

G They throw paper clips at me and paper planes. That really gets me pissed off that does.

T Right. I'm not surprised. Yes, it would upset me too I think. It *does* upset me that they throw things around the classroom. I wish they wouldn't do it.

Graham's comment on liking maths but not other people came as a revelation to me and focused my attention on the social interactions of the classroom. Therefore it may have been more useful to give each child in the class the opportunity to write a diary so as to provide a more complete picture.

I used a hidden microphone with the boys so that they could tape their interactions in a colleague's lesson (with his knowledge) unobtrusively. It was difficult to encourage the boys to reflect on their actions. To ask the question 'Why?' presupposes an understanding in the child's mind of the reasons for his behaviour. The most common reply is of the kind "It's fun being naughty". Reflection without a subsequent action for change has little value. Watching a video and asking, "How did you feel at this point?" may not produce recall of the actual feelings but could elicit an interpretation of the action.

21.5.97, Year 9, Mardell School

(After watching a video of a maths lesson.)

- |         |   |
|---------|---|
| Teacher | How are you behaving?                             |
| Freddie | I'm behaving like a prat. I'm trying to be funny. |
| George  | Didn't I behave well, Miss?                       |
| Teacher | Yes, you did work.                                |
| Ms A    | What would other people say if they saw this?     |
| Freddie | They'd kill me. [Referring to his parents]        |

The above comments are simplistic but an understandable response to the initial question.

### 3.8.4 Interviews

On 9.6.97 I conducted a pilot interview with Freddie. My aim was to elicit his views on the nature of mathematics; specifically, how the way that I presented mathematics affected the way that he interpreted the nature of mathematics. Prior to the interview (on 20.5.97), I had asked Freddie (along with the rest of the class) to list “all the things you do in maths lessons.” His list began with sums, fractions, decimals, pie charts, games and continued with scatter diagram, parallel lines, angles, IT (‘Amazing Maths’, pie charts and graphs) algebra, number patterns and ended with a reference to his text books, G8, G5 and G9. He found some of the topics from his exercise book.

The interview schedule (Appendix 1) began by looking at Freddie’s list to try and ascertain his “views on what maths is.” He found some of the questions difficult to answer and, therefore, I was unable to elicit a great deal of what he thought maths is. When asked which of the things were most important for him to learn (Qu.4), Freddie thought they all were except for games and IT, which were least important. He thought that I must think everything I do is important for the pupils to learn because “I’m the teacher.”

When asked whether his views on what maths is had changed since I became his teacher, Freddie concentrated on the differences between his old school and current school (Mardell). He said that he found the work easier at Mardell and that the single lessons were better than the double maths lessons he had had at his previous school. Freddie also cited me as a difference.

We then went on to discuss the lesson we had just had on rotation. I asked if he thought it was useful to learn rotation. Freddie did not think that it was useful and asked me why I thought rotation was useful. I talked about spatial awareness and the need to pass GCSE,

SATs and the requirements of the National Curriculum. We had a discussion about Pythagoras and the circumference of the circle, which I described to him.

In evaluating the interview schedule, I realised that the difficulty came in phrasing the questions in such a way that they were clearly understood by the interviewee and also expressed what it was that I was trying to find out. Early questions were: "What do you think I like best about maths?" and "What do you like best about maths?" I altered these questions to ones about what I/they think is most important to learn but in the process lost the directness of the earlier versions.

The lack of insight brought by the pilot interview led me to leave this particular interview schedule as a route towards greater understanding of the accessibility of mathematics to pupils with EBD.

Often individual interviews produced richer data, which could provide a critical moment in my research. One example is when Graham stated, "I like maths but not other people" (12.2.99). It made me realise that relationships in the classroom were paramount to pupils with EBD and that it could be fruitful to explore those relationships more closely.

### **3.9 VALIDITY**

At this point I shall review the current debates around validity and self-study in an attempt to find the place of my research in relation to those debates.

Debates around the validity of researching one's own practice centre on the ability to generalise from personal experience, the inference being that studies have no value if they are not applicable to the wider population of practitioners. Robinson and Norris (2001)

state that generalisation is linked to validity because the judgements that are made for linking samples to populations need to be justified. In other words, random sampling ensures that findings can be applied to the wider population. In my own case, sampling was not random but was deliberately *representative*. I chose classes and individuals to record based on their *representativeness* of boys and girls with emotional and behavioural difficulties and their availability to me as their teacher. *My practice* is the focus of the study; therefore, those studied must interact closely with my practice. Choosing pupils at random from the population of all those I taught at any one time may have yielded similar findings but focusing on a particular year group (eg. Year 9) gave direction to the study while I was developing a methodological framework. My data are typical (representative) of my experiences at the time of data collection. Everything I experienced in terms of my practice had the potential to become 'evidence' and, therefore, represent the nature of my practice. I have not omitted 'untruths' in the sense of data that contradicts my findings. For example, taking the concept of *empathy*, evidence exists showing a lack of empathy in my practice. The fact that I have chosen not to present this data does not invalidate the finding that the use of empathy is important to my practice.

Mellor (2001) refers to 'strength' rather than validity, defined as the relevance and accessibility of written research. At the data collection stage, I chose to record certain data (and omit other) based on their relevance in terms of the prevalent research question, novelty or emotional significance. Overall, I need to demonstrate relevance in the usefulness of my findings to practitioners.

To counter the problem of 'anecdotalism' (Silverman, 2000) in my choices of examples, I need to address the extent to which my emerging articulations of how I am and how I work have any validity, either for me, or for others. Having thoroughly looked through and over my data, both as an ongoing practice and in writing up, validity for me resides in the

continuing insights and the vivid moments of recall that I still have as I encounter, transcribe and comment on extracts from my data. I actively seek challenges from colleagues at conferences and in other contexts and I am rigorous in not accepting my perspective as the only possible one. Having said that, my research perspective is 'partial' in that it represents a view through a particular frame of reference, which inevitably must affect the statements that I make about key findings and themes (Chapter 4). My perspective is coloured by my beliefs and principles about teaching, in particular teaching mathematics to children with EBD (3.3 My Practice). Clarification of these personal beliefs allows the reader to judge the partiality and biases of my research and its findings.

In such a highly personal piece of research, it has been necessary for me to aim for *critical subjectivity*. The ability to be critical about my own practice enquiry rests on my awareness of my research assumptions, beliefs about, and principles of, teaching (3.3.8 Summary of Research Assumptions). The questions of bias, rigour and subjectivity are interrelated. Criticality has been achieved through a questioning approach to my assumptions and an awareness of how my beliefs affect the process and progress of my enquiry. For example, under the sub-heading 3.3.7 Motivation, the realisation of the importance of my own emotional vulnerability affected my developing relationships with children.

In my view, validity is predicated on the ability to address the issues of partiality, subjectivity and rigour in a sufficiently critical way. In looking for links between my research evidence, analysis and conclusions, I have questioned the reliability of my evidence. For example, the reliability of videotape evidence can be questioned due to the intrusion of the camera in the classroom. Extensive knowledge of the pupils in my classes allows me to account for this effect on the pupils' behaviour. Do the transcripts then give me an answer to my research question about the accessibility of mathematics to pupils with

EBD? Taken in isolation, the answer is “No” but put together with other research methods – diary, audiotapes and interviews – it can be seen that certain themes emerge.

It could be argued that my research lacks internal validity in that it does not consist of a series of experiments that can be reproduced by others (Cronbach, 1982 (cited Robinson and Norris, op.cit.)). However, I have shown how the procedures I used ensured that my methods were reliable and consistently applied (Silverman, op.cit.). The main threat to internal validity in my research comes from the very nature of the pupils themselves – their emotional and behavioural problems. These are bound to affect the pupils’ responses to being the subject of research but this does not make the research less valid as emotion is a large part of my enquiry (2.7 Emotion Theory).

It could be argued that my research has no external validity in that it is specific to the groups studied and the research setting (ie. school). It is also specific to me as teacher/researcher. However, generalisability to other groups and settings is not the aim of this research. It is a form of *naturalistic inquiry* (Lincoln and Guba, 1985) and, therefore, it is not appropriate for me to generalise. It fits the theory of *naturalistic generalisation*, where it is the reader’s responsibility to make this ‘transfer’ if my account resonates with the reader’s experience. The aim is to present a personal journey of growth through practice enquiry in a way that may encourage others to undertake such a journey.

What has mattered to me, and continues to matter, is the fact of being engaged in on-going personal enquiry. Others will, I trust, find resonance between what I have expressed here and their own experience, which may encourage them to continue probing. Where that resonance turns to dissonance, further research will be needed.



### 3.10 SUMMARY: KNOWLEDGE AND UNDERSTANDING

It has been my intention to answer the questions set in the text of this chapter. For the purpose of clarification, I shall present a summary of those questions and answers.

#### Summary of Questions

- **How have I come to an understanding of my internal ethos?**
- **How did I come to know what I claim to know?**
- **How did I decide what it was that I needed to know?**
- **How did I define that which I considered to constitute my practice?**
- **What did I want to achieve through my teaching?**
- **What is it that drives me to teach?**

I have posed – and attempted to answer – fundamental epistemological questions (see 3.2), without which I cannot justify my thesis.

I make a claim to know and understand the development of my practice (over the last five years). The process of accumulating this knowledge is the story of my research. As well as stating *what* I claim to know, I can indicate how I came to know and understand myself as a teacher because this is the essence of my accumulated knowledge. I believe that my internal ethos has not developed – it has always been there but has required my enquiry to reveal it.

I have not reached a point of stasis – these are fluid constructs: internal ethos, personal theory, practice and self-knowledge. I can define each one at a certain point in time but

then it passes and the definitions wait to be redefined at a later time of reflection. One definition is only valid because of the validity that I place upon it, in the sense of assigning it significance. My internal ethos cannot be judged by anyone else. However, a statement from me defining my internal ethos can and should be open to judgement by others. This is how I interpret a 'living theory' (3.7.3).

What part of my enquiry revealed my inner ethos? How do I identify the set of beliefs that underlie my practice as mine? How do I come to own them? The answer is to be found in relationships, in the way I treat children and adults alike and the way I expect to be treated by others. I do not value the teacher as a superior being in the classroom. I value that which the teacher and pupils bring to the classroom setting. I value the creation of shared meaning.

I recognised myself as a teacher when I stopped needing to justify my actions – or, rather, I stopped needing to explain them to myself. I realised what the 'truth' was for me: for example, risking behavioural difficulties through high expectations. I no longer expect to hear, "This is too difficult. I don't understand." Although issues of behaviour management may emerge, I will spend time with one pupil to make sure that her methods result in a successful outcome. This is also an example of 'being there'.

### 3.11 CONCLUSION

In this conclusion I will review the methods that I used in my research. I will also give an indication of what each method has taught me about myself as a teacher and a researcher.

The primary instrument of research was the diary. (I have summarised its use in section 3.6.6). As a method of research, its main advantage is to record and highlight the

development of my thinking as a practitioner and researcher.

Other methods serve to support the diary. Videotaping of lessons came first. The drawback of this method is the intrusiveness of the camera and the effect it had on the pupils' behaviour. Nevertheless, the tapes served a purpose through triangulation. They were viewed by teacher, pupils and classroom assistant, which proved to be significant in advancing the research, particularly in the area of pupil choice.

Interviews with pupils were particularly useful in revealing their attitudes towards mathematics and the inhibiting nature of the classroom. They revealed to me how the lack of social cohesion increasingly inhibits pupil progress and that co-operation between pupils enables progress to be made in mathematical understanding.

My flirtation with action research was motivated by a desire to be more proactive in the classroom. Attempts to effect change for the better yielded further problems to the one that was initially identified. However, this period can be seen as a continuation of research into my practice.

The pupil diaries were another form of experimentation. Although not wholly successful in allowing the pupils to express their feelings about mathematics, the diaries nevertheless provided insights to my teaching methods. In particular, I saw through the pupils' eyes that it was I who owned the mathematics by writing it on the board (3.8.3, pupil diary extracts).

Over the course of the research, I have had different perceptions of myself as a teacher and researcher. The earlier observations of my teaching were highly self-critical. In seeking to reach a certain depth of reflection, I appear to be more concerned about my feelings, actions and reactions than about my pupils. Later perceptions shift away from this

centrality towards a greater concern for the feelings and motivations of the pupils. This is apparent from the research diaries. At first I positioned myself at the centre of the circle of research – understandably, because I wanted to explore my role as teacher/researcher – then gradually I moved out towards the circumference and the pupils and other issues took my place at the centre. I am now in a position to look inward on my practice.

In the following two chapters, I cover what I have learned from my research. Chapter 4: ‘Key Principles and Findings’ presents what I have learned about children with EBD and how to manage them; Chapter 5: ‘Themes’ analyses what I have learned about me.

## CHAPTER 4: KEY PRINCIPLES AND FINDINGS

### 4.1 INTRODUCTION

In this chapter I will be extracting the principles of what I have learnt about teaching mathematics to children with EBD. (These are highlighted at the end of sections.) I make a distinction here between external environment – influences upon the child outside his control – and internal environment – anything that comes within the sphere of control of the child.

I propose to examine these two influences within the interconnecting spheres of classroom and curriculum. The following discussion alternates between external and internal influences within the classroom and external and internal influences within the curriculum. Within this structure, what matters is the extent to which the individual pupil feels in control of his circumstances and the teacher of hers.

### 4.2 CLASSROOM ENVIRONMENT

#### 4.2.1 Stimulation

At one point it was thought that children with emotional and behavioural difficulties should be faced with bare white walls so as to afford as little distraction as possible. Cruickshank (1961 (cited Hewett, op.cit.)) advocated reduced environmental stimuli and reduced space while, as part of a structured school program, introducing teaching material with increasing stimulus value. Although children with EBD are easily distracted (and some suffer from the condition ADHD), Cruickshank's perspective is essentially a medical (or neurological) one drawing parallels between brain-injured and hyperactive children. I

would argue that the main distractions come from their peers and that, therefore, one should *increase* surrounding physical stimuli and *increase* space in order to draw attention away from other children. However, I have met with opposition to this view. Recently, a Deputy Head Teacher (of an EBD school) ordered the removal of all display boards in the mathematics classroom and the repainting of the walls in a neutral colour. His reasoning in keeping the walls bare was to limit pupils' stimuli to the teacher at the front and the materials on the desk. With fewer distractions the pupils' behaviour would be easier to manage. This argument is based on the assumption that pupils with EBD are *different* from their peers and that they require extraordinary treatment.

According to the DES definition (1989), children with EBD set up barriers between themselves and their learning environment through their behaviour. The assumption is that changes in behaviour will bring down those barriers and make it easier for them to learn. The official definition places blame on the child while apparently ignoring the wider social context. However, the origin of the problem may lie with family and school rather than within the child, except to the extent that the child has internalised certain external messages. Thus, changing the learning environment, so that the child sees no need to put up barriers, may bring about the desired changes in behaviour.

Some researchers recommend a highly predictable learning environment (Hewett, 1968; Wilson & Evans, 1980; Hallahan & Kauffman, 1991). (Part of Mardell School's ethos in 1998 was to provide a consistent and predictable structure for its pupils.) Here predictable does not necessarily indicate lacking in stimulus but it does imply that novelty is sacrificed for security. I believe that planned risk-taking on the part of the teacher can pay dividends both in terms of capturing the child's imagination and, also, presenting mathematics in a more accessible form. The risk usually arises from social or team activities or simply trying something new. (For a further discussion of risk see Chapter 5.) For one, the child

may be more inclined to remain in the lesson – Tobias (Year 10) was designing a circle pattern, “This is the first time *ever* that I haven’t wanted to leave maths” [4.10.96]. Also, their enjoyment could be greater:

I asked [Year 10] “If we were to draw a circle around the school, how large would the circle be?” They measured the length of the school [Mardell] with a click wheel in the hopes of getting the diameter of a circle. They came up with some good suggestions, methods and drawbacks of certain methods. They took it seriously and seemed to enjoy walking around the school. [6.9.96]

An attempt to repeat this activity with Year 10 at Canfield School (October 1999) was greeted with similar positive engagement.

Displays of children’s work, mathematical challenges and ATM posters are designed to provoke questions (“Can we do that?”) that can provide the basis for a new learning experience. Such a strategy allows for a certain amount of predictability within which children will come to expect changes designed to renew their interest. For instance, at Mardell School I began the practice of arranging a long number machine chain along the top of the classroom wall. From a given input, pupils volunteered to calculate the output using only mental or pencil and paper methods (with a small prize for a correct answer). When a new challenge is required, the input or the operations can be varied to produce a different output. The predictability of the learning environment is reflected in the pupils’ questions – “Is that a new one? Can I work it out now?”.

Greenhalgh (1994) states that students are more readily stimulated by content that engages their positive emotions, thereby identifying a need to elicit their (positive) affective responses so that the work becomes purposeful. Where stimuli provoke the response of

wanting to 'do maths' it must be desirable to increase such classroom stimuli rather than to reduce them. It is this that breaks down the barriers to learning. Younger pupils react to seeing others doing maths, especially if it is out and about the school. Trevor, in Year 8, witnessed GCSE students conducting surveys and asked if he could do the same. I explained that it was part of their coursework and he would be doing this in Year 10. A few days later, I overheard Trevor telling the other boys that they had something to look forward to, "We can go out and do surveys when we get to Year 10". Observing older students actively engaged in mathematics models expectations for younger pupils.

Although there exists a tension between increased stimuli and the risk of behavioural difficulties, it is my role to manage such tension where it arises. It does arise whenever I attempt to bring the class together for a discussion or an activity, as in the following example.

#### 23.6.00, 7A, Canfield School

I had a lesson planned for 7A, which started with "Get the point" where they had to guess the leader's decimal number by asking questions to which the leader could only reply 'yes' or 'no'. Then they play the memory game in pairs where the object is to collect pairs of cards, one the multiplication question, the other the answer – a successful way of learning tables so long as it is played regularly.

The boys came in. "I don't want to do that."

"But you don't know what it is until I've explained it."

The trick then is to get straight into the game, almost as they're getting into their seats, and call for questions by name: "James, it's your turn. Ask a question." At



first we (the classroom assistant and I) have to make suggestions (Is it an odd number? Does it have two digits after the point?) until they get the hang of it. Given free rein, however, they will just call out numbers at random.

At the point (after 5 minutes) where I thought they were losing interest, I wanted to stop the game but Matt had just won and kicked up a stink about not getting his go as leader. So I relented and asked Sandy to guess Matt's number while I got the others ready for the memory game. However, Matt was cheating. Every time Sandy asked a question to which the answer should have been 'yes', Matt changed the number he was thinking of and said 'no' so that Sandy wouldn't guess it. Sandy sussed his tactics quite quickly and refused to play any more so I told Matt to sit down and do some writing. 'Writing' tolled the death knell. Matt spends his entire day trying to avoid writing. So, instead of following my instructions, he tried to disrupt others' activities and eventually had to be removed from the lesson.

In this case, tension arose between my attempts to socialise the pupils to 'play by the rules' and Matt's objective to win at all costs and to avoid writing. I can say that I failed to manage this particular tension with Matt in the room. The severity of his emotional difficulties (known to me but not apparent in the extract) could not be addressed within the lesson. **Matt's case exemplifies the importance of considering differing pupil needs within curriculum planning.**

#### **4.2.2 Curriculum**

In this section, I state some of my more general opinions on the curriculum. Cooper et al (1994) maintained that special schools would continue to provide a different learning experience in order to avoid the accusation of being a dumping ground for pupils rejected

by mainstream. The curriculum is seen as contributing to changes in behaviour through its content and organisation. Some schools follow a therapeutic curriculum, modified to give more time to PSE, art and PE, while concentrating on basic skills for the core subjects. Until the late 1980s, the curriculum in special schools was limited by a lack of subject specialist teachers. However, during the 1990s the National Curriculum led to a greater emphasis on the core subjects (Mathematics, English and Science) and a desire to bring more specialist teachers from mainstream into special schools.

The push to standardise literacy and numeracy teaching (particularly in primary schools with the literacy and numeracy hour) has influenced EBD schools, although they have always known the importance of raising levels of competence for their pupils in these two areas. In 1997 Mardell School introduced literacy lessons for Key Stage 3. At the same time, Canfield School began a daily 20-minute session when each boy read with an adult mainly on a one-to-one basis. Here Literacy has been timetabled as a separate subject with some success and it is expected that the same could be achieved for Numeracy. In September 2001 I wrote a numeracy programme for the whole school based on the National Numeracy Strategy and it awaits implementation.

In my experience, there is no need to provide a different curriculum or assign different standards to EBD schools. At Key Stage 4, they provide work experience and outdoor education but there is no need for the rest of the curriculum to be 'dumbed down'. At my present school, I have been told to enter pupils for Certificate of Achievement in Mathematics so that they will leave school with something if they fail GCSE or fail to attend in their final year. However, I believe that the Certificate is only appropriate for the very few pupils who are struggling to achieve Level 3 in mathematics. For the majority it is insulting to say, "This is all we expect of you". My aim is to maintain high expectations and transmit an appropriate message about their self-worth. A few pupils have argued

against taking GCSE, maintaining that it is their choice. Yes, **I believe in pupils' choice but not when it is based on a low opinion of themselves. It is my job to help them realise their potential worth in mathematics.**

In the next section, I discuss 'choice' at the micro-level of decision-making.

### 4.2.3 Enablement

An aversion to writing (Daniels et al, 1999: 46, 48) gives a clue to the attraction of mathematics (with its logical structure) to some pupils with EBD.

“Mathematics is usually an area that EBD children quite enjoy because it does not require much writing, so doesn't pose as much of a threat to their self-esteem as perhaps English might.” (DfEE, 1999:177)

This finds resonances in other places: when I interviewed female A level students (in 1995), some gave “no essays to write” as an important reason for choosing to study mathematics.

Daniels (2001: 44) found that pupils with EBD were more motivated in lessons containing a practical element. To consider 'practical' in its widest sense, the classroom should represent activity as opposed to passivity. In this atmosphere, pupils take responsibility for making choices: for example, choosing materials: coloured card or paper for drawing polygons; 5mm or 10mm squared paper for enlargements or patterns. The classroom environment enables the pupils to exercise this responsibility, giving them access to cupboards, drawers etc. The blackboard is made available for pupils to demonstrate their solutions. The following diary extract illustrates this point.

26.11.99, 10.00am, Year 8, Canfield School

As an example, I drew a number chain on the board with some missing numbers and invited them to offer solutions, which they could write in themselves. They had to work out the rule for the sequence in order to complete the chain correctly. Mick was the first to see that the numbers were doubled each time. Then I asked them to sit in pairs and work out their own number chain and test it on others. Predictably, they organised themselves into one group of 3 (Dean, Stephen and Ewan) and 4 groups of 1 (Nat, Luke, Trevor and Niall) with Sol [classroom assistant] helping Niall. When they were ready, I told them to pass their paper to another boy. If he could not solve the problem it was passed to someone else. After a while, I thought everyone would be more involved if I drew one problem on the board for them all to consider. I started with Ewan's group. Sol and Nat were convinced that it involved multiplying by 10 as some numbers had a zero on the end – it took a while for Ewan, Dean and Stephen to persuade them that this did not work. Everybody thought they had a solution.

Nat then asked, "Can I do my one now?" He came up to draw his on the board. By the end of the lesson, everyone had drawn on the board and each chain had been solved except for Mick's. I sat there with a piece of paper puzzling over this but the bell beat us. Mick's explanation was typically convoluted but he had been very clever and I praised him for his ingenuity.

**Choice at the micro-level of decision-making enables pupils to direct their own learning so that they 'own' the mathematics in which they are involved.**

#### 4.2.4 Stress and Stimulus

Practical work lends itself to collaborative approaches to learning and opportunities for pupils to direct their own learning. However, a policy of enablement (as with increased stimulus) raises issues of classroom management; freedom of movement can mean disruption to the learning of others. The teacher has a preventative role in planning to reduce the risk of conflict. Differentiating teaching materials is one way of achieving this. Keeping children seated at separate desks may be the easiest way to control a class but this subordinates the teacher's socialisation role. Part of the purpose of EBD schools is to improve the pupils' social skills, allowing them to form positive relationships. For instance, one of Mardell School's aims is to "educate pupils to play a full, constructive and responsible role in an ever-changing society" (School prospectus, 1997-8).

I am being asked to balance the needs of behaviour management with that of developing positive relationships through particular kinds of mathematical activity (such as games). An overt behaviour management system such as Assertive Discipline focuses the attention of the class on the behaviour of certain children who can quickly become disturbed at the visual cues integral to the system. To revisit the issue of stimulation, the children here are receiving stimulus of the kind that can escalate conflict. Seeing their names and ticks on the board can aggravate emotional difficulties and draw attention away from the mathematical stimuli of the lesson. Therefore, predictable regimes are not helpful if they detract from the mathematics.

My most successful lessons are characterised by an absence of stress, either because each individual is absorbed in some task or because individuals are co-operating with each other to achieve a particular goal (3.6.5). This might imply a lack of stimulation but it is rather

that the child does not become stressed by the stimulus. At a later date (24.9.99) I wrote in the diary:

The children are easily stressed so it is important not to add to their stress by the way I behave or the kind of maths I offer them.

To raise self-esteem I have to change the way the boys [at Canfield School] think about themselves as mathematicians, ie. as people who engage with mathematics in (or out) of the classroom. I have done a lot of practical work, eg. measuring the perimeter of the school. [The Head] was very complimentary – he said I should be proud of what I'd achieved with Manny as it took the previous teacher two years to get him to do any work – it took me two lessons.

#### 24.9.99, Year 11, Canfield School

Last lesson of the day – nice feel-good lesson, although I couldn't predict it would turn out that way.

11B – had Harry (who has already formed a close attachment to me – we are reading partners), Melvin, who is easily bored but v. clever, and Tim, not too bright but well-motivated.

I decided to play maths games – one I hadn't tried before and one I had – as this is a half hour lesson at the end of Friday before they go home for the weekend. I got the '3-in-a-row' game from their textbook – it was a new one on me. Each player draws a 3 by 2 grid and a leader (me to start with) calls out 6 digits from 0 to 9.

After each number is called, the player decides which square to put it in. The six

digits make two 3-digit numbers, which are added together and the player with the highest total wins and becomes the leader for the next game.

As I called my numbers, Melvin realised immediately what to do and, consequently, won the first game. He wanted me to see what he'd done. He said, "There's a way of doing it, isn't there?" I said "I know" but he didn't want me to give the others any clues, as they obviously hadn't got it yet (ie. the understanding of place value).

I joined in after the first game. Melvin and I kept coming up with identical answers, even when we didn't win. We both placed the digits in exactly the same place on the grid.

What was funny was the development in the relationship between Melvin and me. After each go he asked to see what I'd written so I got up from where I was sitting, walked quickly over to Melvin to the accompaniment of (classroom assistant) Michelle's laughter and my own giggles, which got longer and louder every time I confirmed that we had the same answer. Melvin was loving it, 'though he wasn't laughing himself, and the other two eventually caught on. Tim realised (after several games) that placing a 0 in the first column was not the best place to put it in order to achieve a high result. Harry was smiling at all the hilarity but possibly put out by what was going on between Melvin and me. We played the game for 20 minutes because the boys kept asking for another go.

At the time I interpreted the above as a successful lesson, although Tim and Harry seemed to be excluded from the main action. Another way of interpreting the extract is in terms of the teacher-pupil relationship.

“The teacher-pupil relationship is a fundamental element in the learning process and in the development of self-esteem in the school.” (Gurney, 1988: 87)

Gurney cites commitment to mutually agreed goals as a foundation for enhancing self-esteem, i.e. make the pupil a partner in planning his own learning. He also recommends reciprocal behaviour contracts between teacher and pupil based on respect for the pupil as a decision-maker. The aim is greater self-management for the pupil and a change in the behaviour of both teacher and pupil. For example, the teacher will use reflective listening skills and the pupil will feel it is safe to divulge personal details.

The teacher-pupil relationship is particularly important in the EBD school because of characteristic problems for the child in relationships with parents. Improvement in self-esteem comes with the child’s growing ability to relate to adults in the school, although this does not happen as a matter of course – the adults must teach the child how to relate to other adults and children. The ultimate aim for the teacher is to develop the pupil’s internal control mechanisms and reduce the need for external control (De Charms, 1976). To this end the teacher works “alongside the child” (Gurney, *ibid*) in a way that I have called ‘being there’. The following diary extract illustrates this process.

Canfield School, Year 9, 29.6.01, Mental and Oral Starter

Present are Stephen (S), Charles (C) and me (T).

S Can’t we do more of those we did yesterday? Where you put the answer and we have to work out what it is.

T Oh, you mean equations? Like this... (writes:  $2(a + 4) = 18$ )

S Yeah, like that.



C It's 9.

T What's 9?

C *a*.

T *a* is 9? Is it *a* that is 9? Think about it.

S No – it's 5.

T Good. Why is it 5?

S Because 5 add 4 is 9 and 2 nines are 18.

T That's right. Good. Let's try another one.

S Not so easy this time.

T All right. (Writes:  $20(a + 18) = 480$ .) (Jokes) Charles can't do this 'cause he doesn't know his twenty times table.

C (indignant) Yes I do! (pauses) It's... 24.

T What's 24?

C *a*.

T (Waits) You sure it's *a* that's 24?

S No, it's not.

T What *is a* then?

S It's (stares at the board) 6.

T Why?

C (Interrupts) 6 add 18 is 24 and 24 times 20 is 480. See, I was right.

T Well, it proves you *do* know your 20 times table.

**Both teacher and pupil focus on an object outside themselves (such as a mathematical problem), not on the pupil and work towards a mutually agreed solution. If this situation becomes part of the norms of the classroom mutual respect is generated, enhancing self-esteem in both pupil and teacher.**

These understandings arose from reading on the one hand and reflection on critical incidents (enabled by the diary) on the other.

### **4.3 RELATIONSHIPS IN THE CLASSROOM**

#### **4.3.1 Shifting Locus of Control**

The concept of the self in mathematics can be considered a sub-division of the individual's global self-concept and can be defined as the opinion the individual has of himself in relation to mathematics ("I am hopeless at maths"). The construct can be further refined as aspects of the self relating to particular areas of mathematics ("I am a good model-maker"). The locus of control concerns the extent to which the individual feels in control of his behaviour and covers both the determinants and the outcomes of behaviour. The child may think, "I am a good model-maker because I am skilled at construction"; this denotes an internal locus of control. Alternatively, the child may feel that he is a good model-maker because he has a good teacher, thereby attributing his success to others, signs of an external orientation. In reality, the dominant locus of control is likely to shift between internal and external as a function of the educational situation.

Those children with an internal orientation are more likely to accept responsibility for their own actions and believe that behaviour-outcome contingencies are self-instigated. Children with an external orientation believe that events are beyond their control and are the result of luck, chance or the actions of others. The implications for education are considerable; children who believe their participation in educational activities is voluntary are more motivated, learn and retain more (Solomon and Oberlander, 1974). This implies that children would regard their education as more relevant if they were given more choice of what (or how) to learn. However, as a means of encouraging disaffected youngsters, this

approach has its limitations; would it be effective with those who are anti-school in general? Before attempting to answer this question I conjecture that when children with emotional and behavioural difficulties are compliant it is more likely to be voluntary than the result of coercion. The behaviours of children with EBD tend to be a truer reflection of their feelings and opinions at any given time because they lack inhibitions. They do not expect adults to have the same feelings (anger, frustration) as they do but the children do expect adults to express their true feelings. For instance, a teacher can attempt to evoke a positive atmosphere in the classroom by making positive comments at every opportunity but if these are regarded as indiscriminate and not a reflection of the teacher's true opinions, they will not be believed. Therefore it is important that teachers and students encourage each other to make voluntary statements that are mutually respected. The following incident illustrates how difficult this is to achieve.

29.9.99, 11.30am, Year 10, Canfield School

(6 boys – Andy not present)

They maintained a verbal tirade against Danny from the minute they walked in. Kevin said that Danny had been winding them up all break time (from whence they had just come) and, therefore, deserved it. I had to call Mr T [Deputy Head] as they just wouldn't stop, Kevin and Theo especially. They were calling him "dickhead" and "spastic" with real vehemence and hatred. Danny was powerless to fight back. I too felt helpless. Eventually Theo got up and thumped him on the back. I told Danny to leave immediately for his own safety – the boy seemed bewildered.

Having lost their (human) target, the boys became less passionate and I told them that I found their language offensive. Their response was: why should it bother me? They weren't calling *me* names and if I didn't like it I shouldn't be working there. I

could not make them see that their actions could affect me even though I was not the object of their ire. (In fact, I felt quite upset for Danny.)

They were frank to the point of cruelty about their feelings. I could not respect or accept this or achieve respect for my feelings.

To reach a stage where they trusted me and believed in what I said would take time; without that I would have little influence on their self-esteem. The first step for me is to believe in them; when Stephen says, "I can't do it", I recognise this as an emotional reaction rather than an overtly cognitive one. This awareness (of placing value on verbal cues) is significant to the development of my practice as it validated my intuitive reactions. Stephen was a Year 8 pupil at the boys' EBD school (in 1999). He became frustrated on one occasion when he realised that the lesson was going to be about shape – he feels much safer with number. He refused to wait for an explanation on perimeter; he did not like the look of the page in the book and got up to get another book on number from the shelf. When I protested, he took his book and went to do his sums elsewhere. In retrospect, I could have tried to persuade him to stay by showing him that perimeter was about adding, even writing the first few sums for him so that he had a visual cue on the page. This may have reassured him; then again he may not have been open to any suggestions that day. As he said to me later:

"I was naughty when you first came here, wasn't I? I used to walk out.

Now I'm good."

Permitting children a degree of choice over their learning experiences gives them the chance to influence their environment and encourages them to develop more internal control orientations. Even disaffected youngsters with a generally negative self-concept

will respond in a mathematics classroom that is nondominative, where they can genuinely participate in decision-making within acceptable boundaries.

“Unless the child is challenged, takes risks and makes choices he will not mature fully and later his self-esteem will suffer as a result.”

(Gurney, 1988:71)

Internal attribution of causation is more likely to result if children know that their efforts will be reinforced – a predictable outcome. For instance, many schools employ a system of merits, which children actively try to earn (for their work or behaviour) and which they will attribute to their own efforts. If a behaviour results in a favourable outcome (one with personal value) this increases the likelihood of the behaviour recurring. With the example of disaffected youngsters in mind this can either be to the detriment or the advantage of the teacher’s objectives (as the following section illustrates).

**Shifting the locus of control from external to internal through increased participation in decision-making is one aim of my teaching.**

#### **4.3.2 A Perception of Success and Failure**

##### Andy

Andy often leaves lessons to go and sit with a male teacher whom he admires and respects and who also likes Andy. He knows that certain behaviours in class will lead to his removal and the likelihood that he will spend time with this teacher. Andy has an ‘internal control’ perception of the situation; he knows that his behaviours will result in the outcome he desires. However, his actions do not advance his formal learning within the school

environment. Sometimes his actions do not bring the desired reward; for this he blames the actions of others but he expects that most of the time a well-placed apology can divert punishment. The diary extract below involves Andy and his classmates and illustrates well the factors that influence success or failure when teaching pupils with EBD.

14.10.99, 9.20am, Year 10, Canfield School

All the boys (6 of 7 – Sean was at Music) participated in the aural test, even Andy helped by Dina [Classroom assistant] who positioned herself next to him so that she could help if needed and also try and prevent him from leaving the room. He warned me, “This is all I’m doing this lesson” and he duly answered the ten questions without needing much help. The others were pretty noisy: Kevin calling out the answers, Theo arguing with him over some of said answers, Ivan joining in occasionally, Danny calculating out loud, Neville wanting to know if his answer was correct before he’d do the next question and Andy remaining uncharacteristically quiet.

True to his word, when I gave out the sheet on metric conversions and said that if he were not going to work he would come back at lunchtime to do it, Andy walked out. After that Kevin and Theo got up to read a book on classic cars (which the reading group had left in the room). The others persevered but only with a lot of individual help from me, spending most of the time chatting as they could not move forward without my attention. I quickly realised that the reason for the obvious lack of motivation was that the task was too difficult. So, while Dina prised Kevin and Theo away from the book, I directed everyone to the part of the sheet about time – they had to convert hours to minutes and minutes to seconds. They were more

successful in completing this part as they had more experience of time in their everyday lives than metres and centimetres.

On reflection, I can identify five main factors that affect the success or failure of a task with EBD pupils: ability, effort, difficulty of task, the teacher and the emotion state of the pupil. Three factors are within the pupil's sphere of influence: effort, emotion and, to a lesser extent, ability. The other two are within the teacher's control: difficulty of task and the teacher. One of the aims of the present research is to examine the interplay between these factors. Difficulty of task, for the pupil, is determined by ability. Some factors are situation-specific: for example, effort is transitory and ebbs and flows with mood or emotion state, which is influenced greatly by the teacher's management of the class. Hence, peer influence is not listed as a separate factor because it is interfused with teacher influence.

For Year 10, it was not only that the task was too difficult but that the way it was presented added to its difficulty. They were expected to complete a table with missing values which meant at times converting from kilometres to metres, or vice-versa, or metres to millimetres, and the mental athletics required of them was not impossible but involved a great deal of concentration, which EBD pupils find particularly difficult. I apportion blame mainly to myself (this is how teachers can influence the behaviour of their pupils) because I had not tried the task myself to see how difficult it might be. With the use of *empathy* the situation could have been avoided; the same can be said of my treatment of Andy. Having understood that Andy is a school-phobic, I could have negotiated with him and accepted that the completion of one task for that lesson was an achievement for him. Instead of praising him for his work, thereby increasing the chances of this behaviour being repeated, I threatened him and was forced by behaviour management procedures to

punish him with a detention for leaving the classroom. He would not stay at lunchtime for this detention so I had to ask the secretary to phone Andy's stepfather to say that he would be late home after school due to the detention. At afternoon registration he came up to me, smiled and apologised, offering to redo the detention tomorrow lunchtime because he did not want to stay after school. He stormed off angrily when I told him it was too late, his stepfather has already been informed.

For Andy to be successful, there is a need to address the function of his behaviour (ie. the avoidance tactics) rather than the form (walking out) (Yell, Drasgow & Rosalski, 1999). Reducing the problem behaviour requires consideration of Andy's learning difficulties (his low reading age, for instance), which is a whole school responsibility not just that of the mathematics teacher. The aim is to enable Andy to access the curriculum, support him in his learning so that it is no longer necessary for him to walk out (at the same time removing the reward for walking out). Rather than expecting Andy to meet my standards straight away, I can use negotiation as a tool for providing him with more choice and, therefore, control over his learning experiences.

**The principle for learning here is in the teacher's role of holding the boundary between the external and the internal locus of control, which is a place where tensions need to be played out in order to allow the mathematical challenge in. A possible means to this end would be coercion; the means I use are empathy and trust as they are more likely to lead to increased self-esteem in the pupil.**

#### **4.3.3 Effective Choice for Pupils**

In general, children with emotional and behavioural difficulties have a low boredom/tolerance threshold and, therefore, the more variety that can be offered within the



lesson the better. There are times when children can sustain activities over a longer period (say, 30 minutes) when they find them enjoyable. However, it is better to plan for two or three activities within a 40-minute period.

An example of choice at a micro level involves a class of six Year 9 boys (again at Canfield School, 28.1.00) revising factors. After checking their understanding, I asked for the factors of 24 and wrote their suggestions on the board. They responded well to this task, apart from Carl, who found the concept too difficult. I gave him a set of times tables to help but he could not understand how to use them to find the factors of 24. As he was quickly becoming more stressed I changed his task to a mixture of multiplications ( $3 \times 4$  etc.), which he could look for on the tables. This form of negotiation had the effect of appeasing Carl while also meeting the (academic) objectives of the lesson. At the same time another form of negotiation was taking place. Barry suggested finding factors of 12 next but having already found factors of 24, I thought this was too easy and suggested “72 would be a good one to do”. After a discussion on how to find factors of 72 between three of the boys, which advanced their understanding in two ways – an even number must have 2 as a factor and factors come in pairs, eg. 2 and 36 – Barry said he was going to find the factors of 108 and Lenny chose the number 194. They approached their self-imposed challenges with relish, calling out for my approval every time they found a factor.

Although I had an exercise planned around identifying squares, factors and multiples from a list of numbers, there was no need for me to insist on the completion of this exercise if similar objectives could be met in ways that gave the boys a feeling of control over their own learning.

This lesson shows that decision-making does not have to be at a macro level (“What are we doing today, Miss? Can we...?”) in order to motivate students and internalise the locus of control. **Choice can be made effective for pupils through a process of negotiation**

where it is acknowledged that teaching objectives can be met in different ways and that the teacher is not necessarily the best judge of the 'best way to learn'.

#### 4.3.4 The Search for Stimulation

Children with emotional difficulties are in desperate need of stimulation in order to override the consequences of their experiences, if only for a short time while they are at school. Bobby (aged 12) attends a mainstream school but he has not been able to overcome the difficulties caused by witnessing the collapse and death of his father six months ago. His mother has not been able to allow Bobby to grieve for his loss due to her own emotional difficulties arising from the death of her husband.

##### 28.4.99, 11am, Year 7, Breesdale School

Bobby came into the lesson saying he was going to be good. However, he sat there laying out his tank and soldiers carefully on the table. I told him to put his toys away.

"They're not toys!" he insisted, indignantly. Leo had turned round, very interested in what Bobby was doing. Most people were continuing with the scale drawings of their bedrooms that they had started last lesson but Bobby had not done one, as he had not measured his room. Last lesson I failed to get him to work from the textbook while the others were drawing.

I gave him a sheet of A3 paper but then an idea came to me suddenly that, instead of a room, he could do a battlefield, with tanks and soldiers, drawn to scale.

“Yeah! Oh, thanks, Miss!”. Bobby was pleased. He told others and Bart decided that he wanted to do it too so Bobby insisted they do it together. I said, “OK” and gave him a ruler. They decided they’d have more room on the trolley at the back of the class and moved there. A few boys got up, interested and had a look or spoke to Bobby. Some were envious, I think.

Bobby didn’t know how to start so I asked how big the battlefield was. I pointed outside to the large expanse of playing field we could see from the window and he asked how big the field was. I found myself trying to estimate how many 100 metres would fit across the field. In the end I thought it must be a kilometre in length. Then looking at the A3 paper, I suggested they do 1 inch to 10m so the field would be 10 inches by 15 inches ie. 1 km by 1.5 km. I told them to put the real measurements on the paper but Bobby wrote 10 inches and 15 inches on the plan. I said he could change that next lesson.

Bobby was proud of the start he’d made and asked to show it to a friend who came to the door after the lesson. Bobby was the last to leave.

At the time I had labelled this passage: ‘Searching for congruence of aims’. I was negotiating with Bobby to find grounds for commonality. My aim was for each pupil to complete a scale drawing in order to demonstrate his or her understanding of scale. Nevertheless, negotiation was necessary with a pupil whose emotional problems made it difficult for him to complete homework as a basis for the following lesson. I accept that at this point Bobby did not have a complete understanding of scale but there would be further opportunities to reinforce the concept as he continued with his scale drawing. Now I feel that the extract is also about enablement: creating the opportunity for a pupil with special needs to access mathematics. **Therefore, in the search for stimulation, either by the**

teacher or the pupil, there is an opportunity to ‘grasp’ mathematics (see Ch.2, p.22) and make a connection.

#### 4.3.5 External Judgements

This section is relevant because it has implications for flexibility in teaching. EBD schools are subject to the same criteria for inspections as any school. This makes perfect sense when one refers to research evidence regarding effective schools. Daniels et al (1999) identified five common features of good practice for pupils with EBD. In common with all schools, two of them were effective leadership and a consistent behaviour policy. It was also found that: “Effective teaching skills for pupils with EBD are the same as those for all pupils...” (Daniels et al, *ibid*:1). The authors went on to say:

“Teachers who were well organised, secure in their subject knowledge and proficient classroom practitioners tended to provoke a good response from pupils with EBD.” (p.133)

In a sense, a good school is that which can meet the needs of all pupils. To put this in the context of inspections, Ofsted make no allowances for the disruptive behaviour of pupils in EBD schools; this is why many fail inspections. Mardell School did not fail its inspection of February 1998 but serious weaknesses were identified. The “poor attitude and behaviour of the pupils” were noted, which had a “detrimental effect on pupils’ progress” (Inspection Report, p.4). Lessons are judged ‘unsatisfactory’ in the presence of poor attitudes and behaviour. Emphasis is put on the teaching objectives for lessons, which are supposed to be predetermined and clearly communicated to the pupils. This leaves little room for flexibility once the lesson has started; teachers must predict the need for differentiation and pupils are expected to comply with their directions. This does not reflect a learning

environment where teachers can respond spontaneously to the particular emotional difficulties of a child at any given moment. I believe that teachers should be given credit for taking risks by involving children in the decision-making process. In their literature review, Daniels et al concluded that proficient EBD special schools responded flexibly to the affective needs of individuals.

For the first time (DfEE, 1999) the National Curriculum for Mathematics recognises the role of the teacher in helping pupils to manage their emotions and thereby, “take part in *learning*” (my italics). The teacher’s skill in “identifying aspects of learning in which the pupil will engage...” and “allowing time for the pupil to engage with learning” (DfEE, *ibid.*:79) must be recognised. If this approach is to become part of teachers’ practice, particularly in EBD schools, then it must become part of the advisory and inspection framework. Inspectors should be noticing these situations in the classroom and marking lessons accordingly - otherwise ‘inclusion’ will remain only a political ideal.

Cole, Visser & Upton (1998) report the following comment from staff of an EBD school in their survey:

“A system which judges special schools according to the same criteria as mainstream schools is denying the need for special education.” (p.76)

The same authors conclude from their research, “there is little special about special school practice...” (p.164) and question the need for special schools. Mainstream schools that take an holistic approach towards the child and foster empathy for the child with EBD will make progress towards greater inclusion but they need extra resources in terms of support for SEN. At the same time some children with EBD will only thrive in small special schools with a nurturing ethos where greater attention can be paid to their emotional needs.

It benefits poorly socialised children with low self-esteem and a lack of nurturing in their childhood leading to poor emotional growth.

In the research diary (1.8.00) I wrote:

The EBD school is a unique opportunity to address emotional needs – ‘consistent caring’ – at the same time as teaching. **With the understanding that ‘learning is therapy’, enclosure – enclosing the child in a safe environment – is something that the adults can perform for the pupils. It becomes the pupils’ expectation, their right.**

#### 4.4 TAKING MATHEMATICS OUT OF THE CLASSROOM

##### 4.4.1 Rationale

There is a phenomenon known as ‘classroom mathematics’; specifically mathematical problems which cannot exist outside of the classroom, the sort of problem which is now part of the folklore of mathematics: “If it takes 4 men 3 days to fill a bath...”

In contrast, ‘real mathematics’ is considered to be more relevant and therefore more motivating for young people today. Ainley’s definition of ‘real’ mathematics (Ainley, 1988) is that which is important and meaningful to children and uses mathematical thinking processes. For instance, games can provide a context for using mathematics with which children can engage and place a value on the outcome. Problems may occur when outside agencies (DfEE, writers of mathematics texts) attempt to impose what they believe is ‘relevant’ to children. This raises the question of how one decides what is meaningful to children when this varies from person to person and is context-bound. Practical work tends to be favoured by EBD pupils (4.2.3) but not all prefer to be so active. Constructing and

drawing patterns with colour is invariably a meaningful activity when the pupil can feel proud of the finished product but is not meaningful to a child with poor motor control who has difficulty with a ruler, compasses or colouring to a boundary.

The contrast between *classroom* mathematics (for the sake of teaching a particular concept) and *real* mathematics is gendered. Boaler (1994) talks about the 'make-believe world' created in the classroom. Since the 1980's researchers have recommended that mathematics be placed in a 'human context' for the benefit of girls (Eddowes, 1983) who find socially relevant examples to do with business or medicine more interesting. Chapman (1993) in her study of female college students found that they responded to problem contexts that could be integrated into their personal experiences. A subjective perspective helped them to solve the problem from within. A critical factor in their progress was the sharing of personal stories in small groups, which enabled the women to make the mathematics meaningful. She concludes that mathematics that only exists within the classroom and has no relationship to the real world is less attractive to women. Chapman and Eddowes appear to be pursuing similar arguments where women are more interested in human problems because of their personal resonance. Lave's (1992) theory of situated learning links everyday experience with mathematics in order to motivate learners and help them learn more effectively.

Chapman's assertion appears to be contradicted by Buxton, who claimed that girls prosper when mathematics is presented as a set of "neat and well-controlled situations, with rules that may be memorised and applied" (Buxton, 1981: 124). However, these rules could still be applied to 'real mathematics'; if not then the gender or 'human' argument is about restricting choices. If an outside authority decides what is appropriate for girls, for example questions on make-up or fashion, then this attempt to empower may be disempowering because the result is 'girl-friendly mathematics', which reinforces limited horizons.

Humanising mathematics is in effect restricting the mathematics that females can learn.

Cockcroft (1982) advocated extended discussion for girls and plenty of verbal interaction as essential to the learning of mathematics. Research has shown that this approach benefits all and not solely females (Mason and Pimm, 1986; Thom, 1973). Early GCSE syllabi with a large coursework component saw a rise in girls' performances. If pupils can describe what they see or explain their conjectures to others, this helps to clarify their ideas and leads to further 'mathematizing'. For example, "Discussion has a major role to play in the transition to algebra" (Mason and Pimm, *ibid*: 9). Once verbal expression has become fluent, the words can be written down and simplified in the form of symbols.

What is relevant to the child is whatever fits the child's expectation of what mathematics is. **The child can be educated to broaden his perception of the nature of mathematics through discussion and social activity.**

#### 4.4.2 Mathematical Activity

Socialising situations are vital for the broad education of children with emotional and behavioural difficulties; here mathematics can serve a useful purpose as a contextual tool for developing co-operative relationships. This means that the teacher takes a risk – it is much easier to control a class if pupils are kept separate and prevented from interacting. The following extract details a game played with two adults (the teacher-researcher and a classroom assistant) and six thirteen year old boys (at an EBD school) as an example of a co-operative activity, which will be compared to Ahmed's theoretical framework (cited in Trickett and Sulke, 1988: 115). He lists the factors which contribute to a 'rich mathematical activity':

- it must be accessible to all at the start;
- allows further challenges and extensions;



- invites children to make decisions;
- involves them in speculating, making hypotheses and testing;
- encourages “what if...” questions;
- is non-restrictive, allowing pupils to search in other directions;
- promotes discussion and communication;
- encourages originality and invention;
- holds an element of surprise and
- is enjoyable.

In the next section, I present an example of mathematical activity and examine whether it meets the criteria for a ‘rich’ activity.

#### **4.4.3 Frogs and Toads**

10.12.99, 10.00am, Year 8, Canfield School

My third attempt at Frogs and Toads, having tried it with Year 9 (who became too excitable) and Year 7 (Christian refused to sit next to Stan on the grounds that he had been hitting him on the way to class). All the classes are mixed ability but in Year 8 the disparity is greater: two of the boys are classified as ‘non-readers’, two as poor readers and two have reading ages above their chronological ages and are quick learners (although one was absent today). I felt that they could all take part in this game and take turns with the different roles.

They helped to move tables and lay out 5 chairs in a row. I said that we needed four boys to sit on the chairs with a gap in the middle and one to be a counter. Niall (one

of the non-readers) immediately volunteered to count. I gave each of the two boys at one end of the chairs a piece of paper with FROG written on it and the other two boys were TOADS. That left Trevor to attempt to interchange the frogs and toads in the least number of moves possible. This first attempt yielded 10 moves, although Niall found it difficult to keep up with his tally. Once the game had been demonstrated, they all wanted to have a go at calling the moves. Sol [classroom assistant] thought he could do it in less than 10 and the boys were delighted when he got confused and had to retrace his steps, taking twice as many moves as predicted.

As each boy took his turn (after ten minutes I added another toad and frog so that we all had to join in) I watched him pass through several phases on his way to a solution. Each tried to learn from the mistakes of others and, when he took his place as a frog or toad, criticised moves and offered alternatives to help the mover to a solution. To begin with the first moves were taken fairly quickly but after a few moves each boy paused to think, then restarted more slowly. After a couple of moves he invariably became stuck wanting his frog to jump over two toads (against the rules) but was forced to retrace his last move and rethink his strategy. The moves then took up a rhythm seeming to fall into place until the last frog (or toad) reached his final position.

When Mick took the final turn (we had been playing for half an hour) he stood there mentally moving frogs and toads before he uttered a word. We became impatient with him, however, urging him to get on with it and either his planning went awry or we put him off his stride because he took 25 moves for 3 frogs and 3 toads.

At one point I noticed a quizzical looking Deputy Head staring through the window as we leapt from chair to chair. The Head must have passed by too because at break time he asked me what was going on in my classroom and I replied, "Oh, we were playing Frogs and Toads". "Of course!" he exclaimed, "That makes it all clear to me now". I went on to explain that I had first played this game at our local Numeracy Support Group meeting involving mainly primary school teachers, who found it quite difficult.

As time went by the group became more cohesive with adults and children expressing enjoyment. There were only a couple of arguments over whose turn it was and a brief sulk from Niall when he did not manage to beat Trevor's score. Having a second enthusiastic adult taking part helped the boy's socialisation and so the activity was more successful with this group than with the others. Also, the number of quieter, more conformist boys is higher in Year 8 – most expect to earn merits for the lessons.

'Frogs and Toads' on this particular occasion meets Ainley's requirement for 'real' mathematics. For the boys the outcome of the game had a value: it could prove something about them, that they could compete on the same level irrespective of their success (or lack of it) at 'classroom mathematics'. It also closely matches the requirements for a 'rich mathematical activity'. Every boy irrespective of mathematical ability is able to access the game. It allows for further challenges by increasing the number of frogs and toads. The children have the responsibility for decision-making, speculating and hypothesis-making. They can ask "What if I move..." questions and test their conjectures ("If I move..."). It is enjoyable and the children are surprised at how many moves they take. However, it is not clear how much the game encourages originality and invention, except that each person who takes a leading part feels that they are the first person to make those moves (although

others can see similarities). There is a limit to the number of directions in which pupils can go with the game and, although it does not intend to promote discussion and communication, it seems that participants cannot help becoming involved verbally. **It also helped to develop co-operative relationships (“Each...[boy] offered alternatives to help the mover to a solution”) and social cohesion, which I believe is the most important result of this type of mathematics.**

#### 4.4.4 Limiting Choices

There is a school of thought that the only mathematics needed by children with emotional and behavioural difficulties is that which has a practical application to life outside school. This view may have coincided with a lack of specialist teachers in EBD schools (Westwood, op.cit.). Pupils should learn about bills, budgeting, mortgages, how to write cheques – anything that will have relevance to their lives in the outside world. This is a very commonsense approach; the children themselves ask what the point is in studying algebra since they will never use it in the future. A basic knowledge of arithmetic will stand the child in good stead. However, restricting the mathematics that children learn to ‘everyday mathematics’ pre-empts their future choices. Harris, looking back over 100 years of state education, identified ‘working-class arithmetic’ as an entity separate from middle and upper class mathematics. Inherent in this distinction is the equation of low social status with low-level work and low-level arithmetic (Harris, 1997: 7-9). Reliance on written tests for assessing numeracy keeps social structures in place.

Often the most stable and reliable adults in the children’s lives are their teachers (or non-parent carers) and for these people to present the children with certain expectations of their future lives is vastly influential on the children’s own expectations. Listening to Trevor’s father [Trevor is the Year 8 pupil mentioned above], I am aware of the value that he places

on the practical application of mathematics. He wants Trevor to try harder in mathematics because he will need to check his wage packet at the end of the week. Trevor's father (on his own admission) did not make an effort at school; he learned the maths he needed when he started working on a building site – he learned to measure on the job. However, like most parents he wants more for his son; he would like Trevor to have a head start at school by attaining as many GCSEs as possible, including mathematics. This means that Trevor has to engage with other forms of mathematics but he is a reluctant learner. Trevor is keen on methods of collecting data such as surveys. He finds computation difficult but is happy when the task entails following simple rules. Buxton (1981) found a gender preference for this type of mathematics but where EBD boys have come to expect mathematics to be expressed in this way, they favour its safety and security. In trying to broaden the pupils' views of the nature of mathematics I removed some of that security, which met with complaints – (“Why can't we do maths out of books?” or “I just want to work from my book today”).

Trevor has completed pages of multiplication of whole numbers by 10 or 100, appending one or two noughts as required. In contrast, practical work offers him too much freedom. His condition, ADHD (Attention Deficit Hyperactivity Disorder), means that he has difficulty controlling his movements once out of his seat. Trevor also has problems focusing his eyes in one direction. Educating Trevor is partly about raising his awareness of his movements and providing incentives for him to bring them under control. Real mathematics for Trevor (that with which he is comfortable) may well be pages of numbers but that does not mean that his difficulties should exclude him from other types of mathematics.

**In order to overcome a narrow view of mathematics amongst pupils, it is necessary for me to gain acceptance for a broader view of mathematics by maintaining some level of security around each new mathematical activity.**

#### **4.4.5 A Practical Activity: Bricks**

The topic of measurement lends itself particularly well to practical work. With a group of Year 10 boys I suggested calculating the volume of the classroom. They were able to do this quite successfully but Kevin and Ivan wanted to go outside to find the volume of a nearby school building. I sensed that 'going outside' was the main attraction; nevertheless I agreed to their suggestion, as the roof was triangular so this would be an extension of their work on cuboids. Also, I could watch them through the window and they knew that I could see them at all times. Kevin chose to measure the end wall by counting bricks as he knew the size of a brick off by heart – he had learnt this as part of his work-related curriculum. While Ivan counted bricks for the height of the roof, Kevin counted from the ground to the base of the roof. Returning with the data, they were able to estimate the area of the end of the building and then its volume. I was able to be flexible and allow these pupils to make their own decisions about the direction that they were going to follow and to be inventive with their knowledge while still meeting my objectives. Practical work is more feasible in an EBD school than a mainstream school due to the small groups of children involved. Again, as in Frogs and Toads, the activity served the purpose of developing co-operative relationships.

The above examples illustrate my criteria for good lessons. These emerged from my first clarification of the data as conditions for success (1.3.3), which will be discussed further in Chapter 5. Objectives must be met but within this, a certain amount of flexibility towards pupil decision-making is allowed. Where possible, pupil knowledge is harnessed so that

the work has meaning for them. Working together meets the criterion for developing relationships. Pupil decision-making allows for natural differentiation; they can extend a task in a direction of their choosing as long as I judge it valid mathematically. Empowering the children in this way reflects my trust in them. There is a risk that they will take too much freedom but this depends on the attitude of the individual child at that moment. This usually means that the activity will not be successful. For example, measuring with metre sticks can deteriorate into a sword fight. If they misuse equipment then I have not judged their mood correctly and need to make a decision in the moment to restrict the activity. Alternatively, I can plan a second activity, a worksheet, which will help to settle the class.

**A flexible working relationship with pupils serves to meet both social and mathematical objectives.**

#### **4.5 SUMMARY: PRINCIPLES OF TEACHING AND LEARNING**

The process of writing this chapter serves to clarify my beliefs about what is valuable for the student in my classroom and what is of value in my role as a reflective practitioner. The following is a summary of the salient principles of teaching and learning in my classroom.

1. It is important to consider differing pupil needs (social and emotional) within curriculum and lesson planning.
2. I believe in pupils' choice but not when it is based on a low opinion of themselves. It is my job to help them realise their potential worth in mathematics.
3. Choice at the micro-level of decision-making enables pupils to direct their own learning so that they 'own' the mathematics in which they are involved.

4. Both teacher and pupil focus on an object outside themselves (such as a mathematical problem), not on the pupil, and work towards a mutually agreed solution. If this situation becomes part of the norms of the classroom mutual respect is generated, enhancing self-esteem in both pupil and teacher.
5. Shifting the locus of control from external to internal through increased participation in decision-making is the aim of my teaching.
6. It is the teacher's role to hold the boundary between the external and the internal locus of control, which is a place where tensions need to be played out in order to allow the mathematical challenge in. A possible means to this end would be coercion; the means I use are empathy and trust as they are more likely to lead to increased self-esteem in the pupil.
7. Choice can be made effective for pupils through a process of negotiation, where it is acknowledged that teaching objectives can be met in different ways and that the teacher is not necessarily the best judge of the 'best way to learn'.
8. In the search for stimulation, either by the teacher or the pupil, there is an opportunity to 'grasp' mathematics and make a connection.
9. With the understanding that 'learning is therapy', enclosure – enclosing the child in a safe environment – is something that the adults can perform for the pupils. It becomes the pupils' expectation, their right.
10. The child can be educated to broaden his perception of the nature of mathematics through discussion and social activity.



11. Developing co-operative relationships and social cohesion is, I believe, the most important result of this type of interactional mathematics.

12. In order to overcome a narrow view of mathematics amongst pupils, it is necessary for me to gain acceptance for a broader view of mathematics by maintaining some level of security around each new mathematical activity.

13. A flexible working relationship with pupils serves to meet both social and mathematical objectives.

It can be seen that the overall message centres on co-operation between teacher and pupil - and between pupils - directed by the teacher's influence on relationships in the mathematical context.

Having identified the teacher and the emotional state of the pupil as the most influential factors determining the success of the pupil, I realise that the influence was born of the interaction between teacher and pupil, in which emotions play a large part.

If I work outward from the internal to the external, I am contemplating a thinking, feeling being (who does not think in the absence of how he feels) who is desperately trying to take control of his life but does not know how. Helped by the caring adult, he comes to decisions about his learning environment. He makes a choice guided by a trustworthy adult, who has his needs at heart and will not steer the individual towards anything that would threaten his self-esteem. The adult uses the force of empathy to negotiate a contract with the child for a working relationship in the classroom.

The next section forms a summary of those findings of the research, which I feel are key to the formulation of my thesis.

## 4.6 KEY FINDINGS

### 4.6.1 Introduction

In analysing the results of my research, I make a distinction between *themes* (Ch.5) and *key findings*. A theme is defined as a personal discovery about my practice arising from my beliefs about teaching mathematics to children with EBD.

Key findings have been deduced from the evidence and have direct implications for teaching children with EBD because they represent what I have learned about the children. Of course, themes have implications too but are underpinned by my beliefs, whereas the key findings are supported by the evidence, not necessarily by my beliefs.

Another researcher replicating the study could match the outcomes listed below. The key findings can be used as a comparative tool in different classrooms by other teacher/researchers. They are more easily recognisable as they are less personal and subjective than themes.

### 4.6.2 Social Learning

*Social learning* is one of the key findings of the present research. It is ironic that children who 'fail at relationships' should find pleasure in learning in a very public and social way. This is a generalisation and will not be true for all children with EBD but will be for most, in my experience.

The nature of mathematics lends itself particularly well to social learning: investigations, practical activities, class discussions and problem-solving. However, in all cases variety is the key and I do not discourage individualised learning.

The following extract is an example from the research diary of co-operative practical work.

9.9.96, Year 7, Mardell School

Some experiments, first on estimating how long it would take them to count to 60. Theresa said five minutes so I had to explain that five minutes was a relatively long time. I told her to look at the clock on the wall and watch the red second hand going round and I counted five seconds for her. She decided on an estimate of one minute but it took her 54 seconds. I gave Thomas the chance to revise his estimate from 120 seconds to 60 seconds. He got quite close.

The next task was to estimate how long it would take to walk up and down the steps outside my room three times. Thomas said 24 seconds and Theresa immediately said the same (she's not stupid!). When Thomas did it first he did it in 21 seconds but Theresa decided not to revise her estimate, which again was sensible, as she decided she would walk more slowly than he. Her estimate was closer with an actual time of 26 seconds.

I allow the children to verbalise more than I did in a mainstream school and to give help to each other where needed; to test each other, to check and mark work, to discuss and to lead groups. In mainstream, I was concerned about noise levels and losing control of a large class. Sharing and using mathematics as a social activity is more manageable in small groups.

### 4.6.3 Increasing Stimuli

The purpose of increasing stimuli is to draw the pupils' attention to their physical surroundings and model the imaginative and creative possibilities of mathematics.

Examples of stimuli range from teacher exposition to pupils' display work. The aim is threefold:

- to show mathematics as a living thing;
- to provide a starting point for activities;
- to begin the process of negotiated learning.

Instead of increasing stress levels, providing a range of stimuli could reduce stress in the classroom by motivating the pupils to 'find out' and to test conjectures and hypotheses (problem-solving, investigations, practical work and experiments). The pupils experience less stress in learning (as demonstrated by their behaviour); the activities attract and hold their attention. I can illustrate this with a lesson on fractions with Year 9.

#### Monday 4.12.00, Year 9, Canfield School

Realising that Year 9 did not have a picture of what a fraction was, I made up a game they could do on their feet to give them a feeling of fraction as division of a whole. We pushed tables and chairs to the walls, making a space across the classroom. With a bit of negotiation, the boys sorted themselves into 2 teams, 3 on each. I said that I was going to ask the first two on each team to walk a certain part of the way across the classroom, for instance, halfway across. Whichever boy stood the nearest to the halfway mark earned 1 point; if he was spot on he earned his team 2 points. They soon got the hang of what they had to do and also realised that it was best to discuss amongst the team where each person should go. The teaching

opportunities came with my interventions. After the basic fractions of one-quarter, three-quarters, one-third, I asked them to walk two-fifths of the way across the room. When they found this difficult, I asked them to imagine the room split into 5 equal parts, then how far would two parts be?

I also asked them to walk four-eighths and six-eighths and why the latter should be in the same position as three-quarters, writing this on the board so that they could see the equivalence of the fractions. The boys enjoyed the competitive aspect of the game and it succeeded in dispelling a few misconceptions about fractions.

There was a risk that the game could deteriorate into play fighting as the children were in close physical proximity to each other but it was not difficult to manage their behaviour whilst the game held their attention. There is a boundary here between the positive effect of increasing stimuli and the negative effect of close proximity, one that has to be managed by me in order to prevent the crossover.

#### 4.6.4 Accessibility of Mathematics

At the beginning of the research process I was not sure of the extent to which pupils with EBD found mathematics accessible. Now, from the experiences of the last five years, I have found evidence of the *ease of access* to mathematics. This is due to the low levels of writing skills required for classroom mathematics relative to other subjects, such as English. A poor reader of English tends to find enough cues on a page in a mathematics book (ie. numbers) to enable him to decode the questions.

10.1.97, Year 10, Mardell School

Michael, who is a new pupil, asked if he had to write the questions out and I said, "No, just the answers will do". I said, "Maths is not about doing a lot of writing; in fact we try and make the writing as short as possible." Ben agreed, saying that that's why he always objected to writing working out in the exam. "Why can't you just put the answer? If you got that right, you must have done the right working out." I responded by saying, that was different – working out doesn't mean writing.

Michael wrote his first answer, "Two babies". I said, "That's right but you can just write "2" if you like." "So, I can write the next ones just as numbers, can I?" I said, "Yes".

Also, if mathematics is presented as a living thing (eg. conducting surveys) – something to be done not just read about or written about – pupils are more likely to perceive it as an activity that they 'can do'.

21.1.02, Year 11, Canfield School

Kelvin tells me he hates Maths. However, when it comes to coursework, he is a different person. He concentrates for the period of the lesson, making sure that his work is neatly presented and checking with me that it is accurate. I remember that last year he loved conducting a survey and spent two weeks perfecting his final coursework entry. Carl, also, reacted in the same way. He, again, is a reluctant pupil but he loves devising questionnaires and conducting surveys around the school. They should both do well on this aspect of the coursework.

#### 4.6.5 Importance of Teacher-pupil Relationship

Pupils with EBD cannot learn to build good relationships unless they are encouraged to relate to others whom they learn to trust and who can understand them. The normal teacher-pupil relationship is not enough. Popular teachers may show an interest in pupils but good teachers do not have to have a warm relationship with a child in order to teach effectively. Keeping a professional distance is a quality that some teachers feel is necessary in order to maintain their authority in the classroom.

However, I (among other researchers) feel that if the teacher is warm and caring and shows an interest in both the child and the child's interests then the foundations for a successful learning partnership are laid (Irvine, 2000, Bennathan, 2000, Greenhalgh, 1994). The child can then reciprocate by being more willing to work for that teacher. Whatever terms are used, awareness of the benefits of 'emotional holding' or 'being there' or working 'alongside the child' can make teaching mathematics to children with EBD easier. It is a means of 'reaching the unteachable' to make them teachable again.

##### 15.4.97, Year 10, Mardell School,

I was helping Tobias over two lessons to construct polygons and both times at the beginning of the lesson he had said that he was not going to do any work (14 & 15 April). When I went over to him and sat beside him he started working. I helped him, giving him instructions, step by step, asking questions like, "What is 4 times 180 degrees?", which he was able to do in his head correctly.

At the end of the first lesson, I said that he had worked well and done all the work despite saying at the beginning that he wasn't going to do any work. "Why was that? Why did he do the work? He just grinned and shrugged and said, "I don't know".

I believe in this case that it was the sense of affirmation that I gave him by being alongside him while he was working that allowed him to work.

#### **4.6.6 Summary**

In summary, I have found that children with EBD are social learners, respond to increasing stimuli, find mathematics relatively accessible and value relationships with teachers.

In the above examples, it is possible to gauge why mathematics 'works' for these learners.

My interpretation is based on the above concepts of social and negotiated learning, accessibility and 'being there' for the pupil. The common factor in all of these is the place of the teacher in deciding what is achievable for the learner. The pupil reacts to the teacher's skill in being able to interpret what is right for him – it is a function of the trust that exists between teacher and pupil.

### **4.7 CONCLUSION**

In this chapter, through discussions about choice and enablement, I have signalled some of the main themes of my research: one is empathy and another is trust. Through empathy and trust it is possible to enable learners to negotiate the boundary between internal and external forces.

The Summary of Principles (4.5) provides an overview of each principle of teaching and learning. However, there are common threads between the principles that are worth



outlining here. The use of *stimulus* – in and out of the classroom and appropriate to pupil needs – links to *enablement* as it enables a connection to be made to mathematics. The process is aided by the element of *choice* introduced by the teacher in order to encourage the pupil's ownership of mathematics. Teacher and pupil *negotiate* (hence the need for *flexibility* in the delivery of the curriculum) the process of learning in order to reduce the stress of stimuli and shift the pupil's locus of control from external to internal. Here, the teacher's skill in 'holding' the tension inherent in the transfer of control enables the pupil to benefit from increased self-esteem. The teacher's role is to encourage mathematical activity whilst maintaining some level of security for the pupil.

There are strong links here to the Key Findings (4.6) and the appropriateness of social learning and increased stimuli. As stated above (4.6.5), the teacher plays a vital role in developing a relationship with the pupil based on trust and 'being there'. They are both helped by the particular accessibility of mathematics. In the next chapter, I will expand further on these and other major themes.

## 5.1 CONDITIONS

With reference to Chapter One, I shall elaborate here on the conditions found to have influenced pupils' ability to access mathematics. These conditions emerged as characteristics of my practice. An early manual search of the data revealed ten conditions, some of which are recognisable as recurring themes. I have defined a *theme* (4.6.1) as a personal discovery about my practice arising from my beliefs about teaching mathematics to children with EBD. (Some conditions, such as novelty and differentiation do not occur as frequently. 'Novelty' is incorporated in 'Stimulus' and 'Differentiation' in my normal classroom practice.) These may be influential for any pupils but have particular relevance for pupils with EBD.

A short extract from my research diary illustrates all ten conditions, which I detected as present. Part of the diary is descriptive and part interpretive (in bold).

The code below indicates:

- 1) Flexibility
- 2) Novelty
- 3) Differentiation
- 4) Expectations
- 5) Security
- 6) Trust
- 7) Ability
- 8) Praise
- 9) Motivation

## 10) Attitude.

(9 and 10 refer to both pupil and teacher.)

Diary Extract, 10.10.9, Year 10

- 1) Immediately I heard that Bill was in on Thursday, I decided not to try a lesson like Tuesday's again with me leading from the front. I chose exercises
- 2) on algebra for Kenneth and Ian and Bill and I gave Ben a SAT question from
- 3) level 5-7 as it was an example of trial and improvement on a quadratic,
- 4) although it was harder than the previous examples.
  
- 5) **If the work is pitched at the right level ie. not too easy or too hard and is challenging for them, this may be the key. Also, if it is something new – they don't like doing something they think they've done before.**
  
- 6) It took a while for me to hand out the books and for them to write down the title but then I left Ms A [classroom assistant] to explain Kenneth's work on
- 7) squaring. Bill was able to start off on his own and I explained to Ben what to do with the SAT question.
  
- 6) **With Ben and me it's about building a trusting relationship. He trusts me to give him work that acknowledges his place as the most able in the class/school. He has faith in me and I show that I respect his ability. My**
- 4) **expectations of him are quite high.**
  
- 8) I told them to pack up and that they had worked extremely well that lesson and that I would give them a certificate each. They didn't stop when the bell

- 9) went but took their time to finish the question they were on then pack away.  
Kenneth remained in his seat and I said “well done” when I collected his
- 10) book and pen from him. At one point towards the end they were working in silence and at no point in the lesson did their concentration waver.

### Consideration of the Conditions

- 1) The flexibility here is in my response to the change in the dynamics of the group due to the presence of a non-regular attender (Bill). For this to be possible, I need to have knowledge of the individual and the group.
- 2) & 3) Novelty and differentiation co-exist in the choices that I make about content – I am trying something new with Ben.
- 4) I feel that the pupils are able to cope with quite advanced algebra and, therefore, my expectations are high.
- 5) The issues of security arise from the type of choices that I make about novelty and differentiation; novelty may lead to insecurity, whereas work of the right level should help pupils feel secure and may also develop trust.
- 6) Here is an example of trust between the classroom assistant and me – I am implicitly placing trust on her to share the teaching load.
- 7) (6 & 4) The pupils’ ability determines how I organise the work and the class.
- 8) The end of the lesson is the time for rewards, either in the form of praise or a

certificate.

9) & 10) The pupils were well motivated as they did not stop when the lesson ended.

This also reveals a positive attitude towards the work.

Questions arose from a consideration of these conditions:

- Is any one condition more important than others?
- Do all conditions have to be present for optimum success?
- Is there a factor common to several conditions?

In order to answer the first two questions, one has to imagine teaching maths in the context of the absence of one or more conditions. The absence of trust will make relations in the classroom difficult and insecurity may result. This will adversely affect motivation and, possibly, attitude. Inflexibility can create emotional difficulties. However, the absence of praise, novelty, differentiation, high expectations and ability will not make teaching mathematics impossible.

To answer the third question, many are to do with relationships – trust, praise, flexibility, security and expectations. Others pertain to the strategies and qualities of the teacher – differentiation, motivation, novelty and attitude – which leaves ability as a transient quality as it is perceived by teacher and student and impinges on both relationships and the quality of teaching. Looked at another way, emotions will play a large part in attitude and security – in essence, all relationship conditions.

I could find these conditions in other data and their identification helped to clarify what constituted my practice (effectively summarising it) and which were the important themes

(flexibility, trust, empathy) of my research.

## 5.2 THEMES

In this section, I recount the major themes of my research, which are interpreted as discoveries along the route of my personal journey.

A *theme* arises from the essentially personal nature of the thesis. It represents a message of the research – or, perhaps, the researcher – as it is motivated by my beliefs about teaching children with EBD. I have discerned a need arising from reflecting on my own practice.

Themes arise from the personal dimension of the research; they are *more* personal and subjective. The difference between themes and findings is one of degree; with the findings another researcher would find it easier to replicate the study and match these outcomes. In this sense, the findings exist separately from me. However, the same researcher may not identify the same themes from the research. Risk-taking is the core theme with the others (flexibility, socialisation, choice, trust, empathy) emanating from it. All themes and findings are interrelated in some way. Themes are more abstract and difficult to adopt as part of a teaching policy, whereas key findings (social learning, stimuli, accessibility, teacher-pupil relationship) are easier to take into different classrooms as a comparative tool. It is more difficult to adopt risk-taking as a strategy than it is to increase stimuli in the classroom. Social learning can be more easily observed and identified than empathy. One does not need to rely on the reports of participants to recognise when pupils are doing mathematics that they ‘can do’ (4.6.4 Accessibility of Mathematics).

### 5.2.1 Risk-taking

A major theme of this research is *risk-taking*. The discovery of risk as an important element in my teaching is part of the story of how I came to my way of working. Immersed with risk as part of the totality are other threads like trust, empathy and flexibility.

There are two types of risk, calculated and voluntary (see 5.2.4). Whichever type of risk is involved, the pertinent question remains, if I take a risk, what am I in danger of losing?

- *Calculated risk* means acting on a known factor, using my knowledge to plan a potential encounter in such a way that the risk is *apparent* but the gamble is worth taking, if successful. Lack of success is sometimes worth it in the long run if it helps to further my practice. In the following example, the risk is acknowledged before the encounter as part of my pre-planning.
- Voluntary risk means acting spontaneously in response to an unknown factor, where the level of risk is not apparent at the time but is revealed later by reflection.

#### Mardell School: The Beginning

Here is a story of calculated risks taken within the turmoil of a developing behaviour management system. When the framework of behaviour management is ill-defined, then the risk of failure is greater. It is like walking on jelly when the ground beneath me is in constant motion and I cannot gain a foothold.

3.5.96: Jed, Year 7

The following incident was precipitated by Jed's errors in expressing millions as decimals. When he realised that he had been perpetuating an error, he yelled: "I'm not doing anymore – I don't want to do this!" I calmly said that I would explain the next question to him but he didn't want to know.

"I want a severe!" he yelled but I put his name on the board, asked if he was going to work and, when he said "No" I put a tick next to his name. He asked for a severe again – I refused. (I felt, "Why should he always get what he wants?")

It was at this point that he tore the pages out of his exercise book, threw them in the bin and hurled his pen across the room, so he got his way in the end, as I had to call the senior teacher to take him away.

While I was writing out the slip I pointed out to Jed that if he wanted to talk to a senior teacher he didn't have to tear up his work – he could ask and I would get someone. I added, "It would be helpful to me".

"I'm not here to be helpful to you" came his immediate reply, which served me right but I was annoyed at this point at the work he had torn up.

The above extract illustrates a time when the conditions for successful risk assessment were not known. It was likely to fail due to a false assumption on my part that I must remain *in control* at whatever cost. Hence, because I had not made an emotional connection with Jed, our aims did not coincide. In fact he pushed me away; kept his distance. On reflection, they may never have coincided but approaching the encounter in a



more empathic way (awareness of his fragile self-esteem) may have brought me to a closer understanding of his particular needs. If I had kept a closer watch on his writing, I could have picked up his misconceptions of how to abbreviate large numbers earlier and pre-empted any problems. Instead, I allowed the perpetuation of errors up to the point where Jed could not accept the scale of his failure in his own eyes. Instead of putting his name on the board when he yelled for a severe, I should have offered Jed the opportunity to talk to another teacher (outside the room) and discuss his frustrations. He told the senior teacher that the work was too difficult. I replied that I thought he could do it with a little explanation from me but I could give him an easier booklet, *Decimals 3*, to work from, which I did.

To answer the earlier question, I am not in danger of losing the pupil's trust or respect for me because he has none. This represents a threat to my professional self-identity; I am in danger of losing the ability to teach him, not just at that moment but on future occasions. None of the conditions for a successful teacher/pupil relationship are present: no empathy, trust, understanding or mutual respect. My feelings at the time reveal my lack of respect for Jed - *Why should he always get what he wants?* At the time I perceived this encounter in terms of a traditional asymmetry of power between the pupil and me where I struggled to maintain dominance (*I'm not here to be helpful to you*). The risk calculated was in the usurpation of power and subsequent loss of control. My security was the hierarchy of the behaviour management system, in which I placed too much faith. I needed to rely on my own instincts, which is the way I operate now, informed through ongoing reflection.

At a later point in my journey, I am able to take risks in a more assured way, as the following example illustrates. It is a calculated risk because I am repeating a successful activity given earlier in the day to a parallel Year 9 class (4.2.4 Stress and Stimulus).

29.6.01, Year 9, Algebra, Canfield School

Present are Kieran (K), Henry (H), Trevor (T), Nat (N), Naim (M) and me (T).

Teacher writes on board:  $2(a + 1)$ ,  $2(a + 2)$  etc. for pupils to multiply out.

K This is easy, Miss.

H Give us a challenge.

K Yeah, Miss. Give us a challenge.

T OK. I'll make it harder. \*

[Writes  $7(a - 5)$  on board. T and N work slowly continuing the original pattern. M has stopped after 5 examples. K and H have problems with subtraction sign at first.

K writes  $7 \times a \times 7 - 5$ .]

K I'm not sure about this.

T It's the same as before Kieran, except instead of a plus sign it's a minus. So that's minus 7 times 5.

[K writes it again then continues with  $7(a - 6)$  etc.]

K It's pips, Miss. This isn't a challenge!

T All right. Do this. [Writes  $2(a + b)$ ]

K Oh, what! I can't do that! \*

N It's too hard! \*

M No, it's not. I can do it.

T Go on then, Naim.

M That will be 2 times  $a$ ...

T Yes...

M ...then 2 times...

T  $b$

M  $b$ . Yeah,  $b$ .

[T writes this on board]

T So in shorthand?

M That's  $2a$  add  $2b$ .

T Good. Well done. [To rest of class] He's got it! Naim's got it.

K So, I can do it too.

T OK. [Writes 3] Give me a letter, Harry, any letter.

H z.

[T writes z.]

K  $f$ .

T OK. [Writes  $3(z + f)$ ]

K I can do this.

T Show us, Kieran. [Offers him the board pen. K gets up and writes:

$$(3 \times z) + (3 \times f) = 3z + 3f.]$$

T That's right!

[K does a victory dance.]

I have placed \* at the places of potential risk. I could not predict exactly how the pupils would respond but I had calculated that I would be able to take the algebra as far as they were prepared to go.

### 5.2.2 Instincts

Recognising what I am about to elaborate as my *instincts*, is part of the process of 'coming to know' my practice. I rely on my instincts to manage my classes (to a certain extent):

- i) Primarily, *sensitivity* to the children's emotional state at any given time. I interpret attention-seeking behaviour ('acting out') as a cue to address the *emotional*.

- ii) Secondly, *strength of will* combined with *flexibility*. Negotiation is not a case of 'backing down' but is one of willingness to compromise in order to meet the child halfway – it is her instinct too.
- iii) *Trust* of others, which I expect to be reciprocated, is a natural part of my teaching.

The shift towards recognition of these three qualities came over a period of three years (1997-2000) in which I moved schools twice and would not have occurred had I stayed at Mardell School.

To elaborate, had I stayed at Mardell School I would have had joint responsibility for the ongoing development of the behaviour management system according to the consultative nature of policy-making in the School. However, I would have to have been confident that I could survive within that degree of uncertainty. By this I mean that I was living/working with the expectation of constant change, not knowing when or in what form it was coming. This was most marked when I returned from maternity leave of one term, whereupon I had to learn a new set of rules for behaviour management. The children were also living with these new rules and took advantage of my uncertainty.

Taking risks against an insecure background is one way in which my risk-taking resonates with pupil risk-taking. For pupils to learn they must take risks within a secure and trusting relationship with their teacher – without this pupil and teacher are moving in opposite directions. Security for the pupil is represented by the defensive refusal to work and for the teacher security means dependence on an impersonal, inflexible *system* external to both teacher and pupil, with no place wherein both parties can meet and work towards shared responsibility for the education of the child.

On a basic level my approach was too self-centred; I did not seek to balance my feelings with Jed's or to consider Jed as a person with equal rights. *I'm not here to be helpful to you*, is a cutting comment, which reveals the lack of any common ground between us. I know that Jed had difficulties respecting females (although I did not know why) and this informed a lot of his behaviour towards women in authority. Therefore, using 'lack of trust' as a frame of reference with which to interpret this incident reveals to me how closely risk-taking and trust are entwined.

At the time this incident helped to develop my practice by providing further insight into the kind of emotional and behavioural difficulties that can be triggered by the way I present mathematics. At the present time I have a greater understanding of the position I was in then as a 'new' teacher and the qualities I use now to manage both mathematics and behaviour.

#### 17.6.96: Frank and Natalie Year 8, Sam Year 10

I tried mental arithmetic tests on everyone except Year 9 and was surprised at how successful they were. Frank was reluctant to fail – he wanted to copy Quentin but I helped him get started. He had this attitude (like Natalie) "I don't want to do it – I'm not doing it! Don't know, don't care - I'm not doing it!"

But I wouldn't take no for an answer and coaxed them into it – I helped Natalie by interpreting every question for her then she worked it out and I could tell her immediately if she was right or not. This was her first ever 'test' like that and I praised her for completing it.

I used a strategy of saying "think again" rather than "no" when an answer was

offered. This gave the pupil an opportunity to save face; they invariably said,

“Oh no, no I meant...”

Sam (Year 10) was most vociferous in his objections. I explained the first question (write a number in words) but he didn't get it so I virtually gave him the answer (I wrote it down). I worked through the second one with him and when he got it right said, “Yes, good”. He was then happy to start writing his own answers. Sam had most problems (as did most of them) with division. With  $18/3$  Sam, Natalie and Frank all drew lots of 3 strokes  $///$   $///$  etc. till they made 18 then counted the sets of 3 – even then Sam miscounted and gave the answer as 5.

I think they finished the tests feeling more confident about doing this kind of thing than when they started. I had been afraid that they'd think arithmetic practice ‘babyish’ – in fact, in general, they quite like it because it is more familiar than many GCSE topics; they have been used to arithmetic. Here Sam decided that the test represented an acceptable level of threat.

Sam, when he finished his test said, “There, see, I'm not thick, I *can* do it”. Of course I had never said or implied that he couldn't do it but that is his stock response to a threatening situation.

The result of evaluating the initiative of arithmetic tests was that the gamble had paid off. Most found it an acceptable way of ‘doing maths’ because it coincided with their perception of the nature of mathematics. It was *my* perception of the nature of mathematics that made me so persistent in championing the cause of mental arithmetic. I am not so much concerned that it takes the form of a timed test taken in silence but that it can lead to discussion and greater understanding of particular types of calculation. Here is evidence of

the ‘common ground’ – which allows the pupils and me to take risks - that was lacking in the example about Jed.

More importantly, I have found a point of connection with a child through the mathematics. I have used arithmetic within a particular structure that enables all of us to work through our emotions. Also, the pupils’ way of thinking about mathematics is a product of my attitude towards them *and* my attitude towards mathematics (for example, Sam above).

### 5.2.3 Common Ground

*Common ground* can be interpreted as the place where an emotional connection and common aims develop (as in the example above with Year 9, 5.2.1). I am looking to advance the emotional development of the children in attending to this emotional dimension. For instance, the pupils’ aim is not to fail and my aim is not to allow them to fail – here the affective and the cognitive are combined. I can contrast this with Vygotsky’s *Zone of Proximal Development* (1978), which is a concept that covers the cognitive development of the pupil.

The nature of risk here is different from that with Jed in that I am more empathic – “I wouldn’t take no for an answer”. I used the mathematics to make a connection with Natalie and Sam, to show that they could ‘do it’. Natalie continued to have crises of confidence – she tore her first SAT paper in two the following year. It was meticulously taped together by the Deputy Head and sent away – Natalie passed with Level 3.

Others, like Sam, felt threatened but managed to find a means of accessing the questions (as with the drawing of strokes). Ensuring success through the accessibility of the

questions is an important factor in developing trust and reducing the risk of failure.

‘Leading’ the children towards success is another strategy, which I employ to encourage thinking around a problem; leading and then stepping back in the way that a mother does when a child takes her first steps but standing by at all times ready for a fall. Of course another possible interpretation is that I am ‘cheating’ by helping the child but the skill lies in knowing when to support (to ‘be there’) and when to let go. I take the emotional state of the child as my cue. I cannot always judge correctly when is the right time to intervene but it is about enabling the pupil to make the connection with mathematics, grounded in my belief that it is possible for all pupils to find some satisfying nexus to mathematics. I must ‘be there’ before they have made the link and ‘let go’ after they have connected.

#### 5.2.4 Voluntary Risk

Voluntary risk means acting spontaneously in response to an unknown factor where the level of risk is not apparent at the time but is revealed later by reflection. The risk is recognised in post-evaluation but at the time I am not attuned to it, not sensitised to it – it is not significant. This raises the question of how one cannot know *in the moment* that one is taking a risk. Does it constitute a risk if I am not aware of it? The degree of emotional connection is the key. If risk is a threat to personal identity, I must be aware of it.

Therefore, voluntary risk is not an immediate (recognised) threat to personal identity.

I will return to this issue after the following transcript. It illustrates risk-taking for the pupils *and* teacher, partly because the lesson is recorded on video, which brings a tendency to perform for the camera and partly because there is a risk of failing on camera.



Excerpt of Video Recording 21.5.97, 12.11-12.14 pm, Mardell School

I am teaching a group of three Year 9 students. In this extract, George (G) and Freddie (F) are sitting next to each other answering written arithmetic questions. I am the teacher (T).

F Is this going on recording all through the lesson?

T No.

F [Very quiet] Yes. [Pulls arm down sharply at the elbow]

T We started at twelve o'clock didn't we?

G [Reads] Write nine hundred and ninety-six to the nearest hundred.

F Yes. Is there still recording going on?

T We'll have to see. Right what's the next one?

G [Reads] How many grams in two...(and a quarter kilograms)

F What time does the lesson finish? Twenty past?

T Don't worry about ( ). Just do your sums.

F Does the lesson end at twenty past?

T Twenty-five past. We'll stop the video at twenty past.

F Can't we do something fun. This is boring.

T Do you know how to do the next one?

F Yeah.

T Go on then. Write down the answer.

G One thousand. [Puts on a silly voice] Then the next one's two thousand and twenty-five.

T Don't tell him the answers, George. I'm sure he wants to work it out himself.

F A quarter's twenty-five.

**T** Mmm. [Nods in agreement] Oh, hang on a minute. [Takes his paper] That's not right, is it?

**F** Two and a quarter.

**G** Ah! I know what it is. Two two five O.

**T** Why is it two two five O then?

**G** 'Cause a quarter of a thousand is two hundred and fifty, isn't it?

**T** That's right.

**G** Twenty-five is a quarter of a hundred.

**F&G** [read] Find the change from one pound after spending nineteen p and seventeen p.

[F adds 19p and 17p on paper and G tries to work it out in his head.]

**G** Nineteen plus seventeen equals thirty-six. Thirty-six.

**F** Minus one pound. Thirty-six.

**G** Forty-four p. No, sixty-four p. [Leans over and looks at F's answer] Sixty-four p.

**F** [Reads] What is the average of [Writes] six plus nine plus seven plus ten?

**T** Do you know how to work out averages, George?

**G** Don't know. Averages. I know we've done these.

**T** What is the average of those numbers?

**G** (Ship) Add 'em all up, don't you Miss?

**T** Yep.

**G** [Writes] Six plus nine plus seven plus ten. Sixteen plus ten, twenty-five, thirty-two. Times by four. Thirty-two fours. Ten fours are forty. That'll be, oh, a hundred and twenty plus.

**T** Why are you timesing? You've got to divide.

**G** Oh, s...

**T** How many fours in thirty-two?

**G** How many fours in thirty-two? Four. No, that'll be, dur. [Hits head with hand]

**F** Done that side, Miss.

**G** Um, er, twenty. Oh, fucking hell! [Laughs and slaps hand over mouth]

**T** [Laughs] Oh, George!

**G** How many fours are thirty-two? Four, eight, twelve, sixteen.

**T** I'm not sure I know how to edit this tape.

**F** Huh?

**T** I'm not sure I know how to edit this tape.

**F** What do you mean, edit?

**G** Twenty.

**F** What, cut it out?

**T** Yeah.

**F** Yeah, well when you...

**T** Cut the 'F' words out. [To **G**] I'm going to have to put another tick up now, aren't'I?

**G** No, I said...[**T** pulls a face and he stops] Twenty-eight, thirty-two. Eight.

First the camera, then the nature of the lesson (arithmetic practice), represents a risk of failure for the teacher. Freddie's comment – *Can't we do something fun? This is boring* – signifies the presence of voluntary risk to the teacher. However, from my perspective at the time it was not a risk; I did not feel a threat to my professional identity. It was a remark that I ignored because there was no emotional connection. Freddie had been prevaricating up to that point, while I tried to steer him back to the questions. His remark became a critical incident on reflection as I used it during a session of triangulation viewing the tape with the pupils and classroom assistant. I wanted to probe what 'something fun' might be for them. There was an implicit risk for me in that Freddie's interpretation of *fun* might

challenge the very tenets upon which I had built my philosophy of mathematics. As it happened, this discussion led directly to curriculum change, in that I agreed to incorporate their ideas giving one lesson a week over to mathematical games. I felt that I had met them halfway without compromising my principles.

I interpreted Freddie's behaviour as anxiety over the video recording, although it is George who seems to be making elementary mistakes with his mental arithmetic and is embarrassed at swearing on tape. Freddie then proceeds to finish the work before George ("Done that side, Miss"). Both boys are in danger of losing face and feeling foolish. They become more self-conscious and aware of their actions.

The pupils then are aware of the risk to their self-esteem. It is apparent to them (therefore calculated) but not to me. Freddie's initial question makes it clear (to me on reflection) that he has calculated the risk from the start.

"Is this going on recording all through the lesson?"

"No."

[Very quiet] "Yes."

Despite Freddie and George's anxiety, they are willing to take the risk of 'performing' on camera partly due to an innate ability to manipulate number. Even though George becomes confused, he is aware of his error and corrects himself. George will also take risks due to his impulsive character – this tends to be a characteristic of children with EBD.

### **5.2.5 Content and Method**

Some researchers have taken the unpredictable nature of emotional and behavioural

difficulties as an argument for predictability and routine in the classroom (see 4.2.1 Stimulation). Above all the classroom should be made safe for the children. I agree with this view in regard to classroom management issues but I have found the confidence within this environment to take risks with methods of learning - and the content of - mathematics. Any teacher can also experiment with styles of teaching. I discovered that risk-taking is an important element in my teaching, although it does not always lead to successful lessons.

Taking risks with *what* I teach (content) involves presenting mathematics as a 'difficult' subject but one that, therefore, has kudos so that if the students are successful, their self-esteem is given a (much-needed) boost. However, if the students fail to understand, they become bored and restless and turn their attention towards each other - all tried and tested ego defence mechanisms. An example is given in 3.6.4 (Example 1) with the diary extract on Ben. It is about believing in the students' capabilities and offering them the same opportunities as students of the same age in a mainstream school. It is an often-voiced concern of students with EBD that they do easier work in their special school than students do in mainstream schools.

#### 5.9.00, Year 10, Canfield School

Lenny (referring to work on approximating pi): "Would they be doing harder work than this in other schools?"

Teacher: "No. This is level 6. Their work is just as hard as yours."

In a way, students in the special school benefit from being treated differently from their peers in mainstream schools: more overt care, greater share of teacher time and frequent opportunities for counselling. However, they could also be said to benefit from equal treatment to their mainstream peers (3.3.1, 'Ben').

Taking risks with *how* I teach (method) denotes a willingness to attempt (what are for me) new approaches to teaching and learning mathematics. As stated in 4.2.1 (Stimulation), the risk arises from social activities or trying something new.

### 5.2.6 Trust and Risk-taking

Taking risks presupposes an element of trust in the relationship between the risk-taker and the person on whose behalf the risks are taken. Although I am not always taking a risk *for* someone else, in the teaching/learning relationship between the teacher and pupil risks are inevitable due to the nature of emotional and behavioural difficulties and of mathematics. I will take a risk with *what* I teach for the benefit of the child, eg. teaching inequalities to Year 11 boys in order to increase their chance of a grade C pass. The boys supported each other in meeting the challenge of learning to represent inequalities on a number line. This was an example of social learning; they not only trusted me but they trusted each other.

The boys generally liked each other and got on well. The leader of the group was a strong natural mathematician, who particularly enjoyed mental calculations because he did not like writing. In fact, he had struggled all his school life to learn to read and write and was still struggling. The other boys looked to him for help and so I made him 'pupil-teacher' for some of the lessons. He stood at the board and demonstrated his method and then questioned other pupils to test their understanding. I supported Jon from the side-lines, stepping in gently if he made an error but always there as a back-up.

In order to learn, the pupil must be open to new ways of thinking, subjugating the ego and welcoming the new experience (4.4.3, Mick and “Frogs and Toads”). A child with emotional and behavioural difficulties is egocentric and has learnt to be defensive and closed to experiences that have proved threatening in the past. In other words, the child has learnt that learning brings failure, either because of particular learning difficulties or because of social difficulties relating to peers within the learning environment. Therefore, the risk of failure is real and the pupil remains unreceptive to learning. On another level, both pupil and teacher feel insecure because pupil behaviour is unpredictable, although it is the mark of a good EBD teacher that she or he is able to project a sense of security and remain calm whilst managing difficult behaviour.

The risk to the teacher too is one of failure – failure to engage with the pupil in the exercise of thinking about mathematics. Mathematics is a difficult but not inaccessible subject (4.2.3). Mathematics represents a different challenge to English with a higher level of literacy required to succeed at English. There is still a risk of the teacher being unable to communicate an understanding of mathematics to the pupil (3.6.5, Diary extract, Frank). It is possible to teach mathematics with minimal risk but progress will be slow due to the lack of appropriate challenge presented to pupils. For instance, EBD children would never experience algebra, as it is not deemed to be relevant to their lives. One of the few lessons I have found to be ‘fail-safe’ with EBD pupils is solution of equations using trial and improvement methods. Most are able to sustain this work on a calculator for at least 30 minutes in an attempt to get closer and closer to a solution. The exercise also provides a very good sense of place value and a strong sense of the connection between number and algebra. This is the reason why I enjoy taking a calculated risk in teaching algebra and part of the equation is a consideration of the level of trust existing between the pupils and me. Establishing the level of trust (in order to add this to the calculation) is an instinct (5.2.2 Instincts), something that is sensed.

Trust cannot exist without liking; there must be a bond of mutual respect and understanding, of empathy and confidence in the other party, a dependence on that person to have one's own interest at heart. In this sense, trust cannot appear spontaneously; it has to be developed over a period of time, in which the participants in the relationship develop an understanding of each other's needs and personal objectives. I, as teacher, must teach personally or mutually chosen objectives within a 40-minute period. The pupil, however, may have alternative and conflicting objectives. The role of the responsible adult then becomes one of negotiating and seeking common ground in order to recognise the value in the pupil's stance.

It may be that each time the pupil answers a question in front of the class he is placing his trust in (me) the teacher. Trust under these conditions means the recognition of the possibility of failure on the part of the pupil, whose risk assessment allows him to experiment with mathematics without permanent damage to his self-esteem.

### **5.2.7 Flexibility**

It is imperative that teachers of children with EBD feel confident enough to maintain *flexibility* in their approach to teaching their subject. Teachers need to be flexible in regard to emotional difficulties, lesson plans, potential interests of children and directions chosen by them. In theory, it is possible that excessive flexibility can lead to the abandonment of mathematical objectives but I can only find examples from my research where flexibility has *enabled* the child to achieve mathematical objectives. Therefore, I conclude that sensitivity is an enabling tool for teachers so long as they do not allow themselves to move into a position of 'excessive flexibility'.



7.1.97, Mardell School, Damien, Year 9

The background to this incident is that Damien had been warned not to stand on the pipe that borders one wall of the classroom. I followed the behaviour management system by putting his name on the board. When he did it again I then had to put a tick next to his name, which meant a loss of merit. Damien threatened to walk out and I tried to persuade him to stay.

“Don’t go out Damien because that will earn you ten minutes detention, which you don’t want. And it will mean a slip home.

George joined in, “Don’t go out Damien”

After a couple of beats he came back in, sat at his desk and asked to see a senior member of staff. I said I was happy for him to talk this over with somebody and asked Mr E (who had come in to support maths) to phone for one but it was engaged.

Damien insisted that he was doing no work until he saw a senior member of staff, although I had put his books on his table. I said that he couldn’t refuse to work while he was waiting because we didn’t know how long it would take and we hadn’t even got through yet. I said we were doing factors and opened his book to the relevant page.

“I’m not on this anyway.”

“No, you’re all on this now – we’ve started something new this term.”

“I’m not doing that.” Damien stabbed his finger at the opposite page to the one I wanted him to do.

“No, it’s this page.”

I went away to check on George, who had started, helped by Mr E. Meantime, Damien slammed his books on the table muttering to himself but he started to write the title and date and was calm after a minute.

I hesitated because he appeared calmer but decided to ring again and got through this time. I didn’t tell Damien that I’d called – I think he might have heard anyway.

I judged that he was receptive to listening to me now so I went over and explained the work and stayed with him until he had done the first 2 questions (find the factors of 12 and 27).

While he was working, Mr I (senior teacher) came in. Damien looked up at him but carried on writing, which gave me a clue that he was there, as I didn’t hear him come in. I turned and said, “Oh, hello”.

“Hello” he replied.

“Damien? I queried.

“Oh, yeah.” He got up and went out in front of Mr I. After 5 minutes I heard them coming back. Damien was saying something to Mr I but he wasn’t moaning; he sounded equanimous.

This example illustrates flexibility in that I was able to use sensitivity to Damien's emotional difficulties to enable him to access the lesson on factors. It illustrates when to 'be there' and when to walk away. I established my objectives from the start; he must write the factors of 12 and 27. However, I did not give him my undivided attention – I had a duty to help George too. Part of teaching mathematics in the context of EBD is helping children to share the teacher's attention, although the desire to monopolise the teacher reduces as the children grow older.

External pressures affect the ability of teachers to be flexible. Mathematics teachers are subject to the stringencies of the National Curriculum, National Numeracy Strategy and Ofsted inspections; all designed to raise standards of achievement across the country (4.3.5 External Judgements). I am not arguing with this aim but I do believe that standards will not be raised for children with EBD unless they find meaning in what they are asked to do (4.4.1 Rationale). I (and I believe others) can be flexible within a long-term framework of national requirements, so long as I maintain an overall vision of the aims and objectives for each year, class and individual.

The unique role of the special school teacher has recently been recognised by the DfEE (op.cit.) with reference to helping pupils manage their emotions (see 4.3.5). The mathematics teacher can also help pupils engage with the subject by the means described above and by allowing an element of choice in the classroom.

### **5.2.8 Choice**

Pupil involvement in planning their learning has been advocated by exponents of *flexible learning* and *negotiated learning* (Richmond, 1993; Garner, 1993). *Unplanned choice* involves more risk for the teacher but can be used to some effect (4.3.3 Effective Choice

for Pupils). The relationship between teacher flexibility and pupil choice is straightforward; the flexible teacher allows the pupil more choice.

The risk for the pupil lies in the trust embodied in the teacher-pupil relationship. The teacher is empowering the pupil through the process of consultation and negotiation. Not only this but the pupil is made more aware of the composition of mathematics and, therefore, can reflect on her feelings about aspects of the subject. The risk for the pupil is in having to address the issues involved in choice, making micro-level decisions, although this should allow short-term confidence to grow. There is a risk in taking responsibility for her own learning when this had always been placed with the teacher. Trusting someone (the teacher) with power over you is about letting go; it is about accepting decision-making power, which is a risk. *Will I make the right decision? Will I repay the trust invested in me by another?*

The risk with introducing choice to the EBD classroom is that the pupils themselves (though not Carl in the following extract) - and colleagues - may see it as appeasement.

#### 5.11.99, Year 9, Circumference, Canfield School

In the previous lesson they had found an approximation of pi by measuring circular objects with string and ruler and dividing  $C$  by  $D$ . Today's exercise was to find the circumference of circles by using 3 as an approximation for pi and multiplying the diameter by 3.

I had laid the G7 (SMP, 1987) books and folders out on the tables to save time but when Carl came in he immediately said, "I'm not doing this" as soon as he saw the books before he'd even sat down. In fact, he wouldn't sit down. When I said

everyone was doing the same thing and I was sure he'd be able to do it, he said, "I'm going then" and walked back to the door. At that point, Mrs C came in offering to help and brought him back in with the others.

We got them sat down. I gave out compasses and asked them to draw two circles with diameter and radius marked on them and "radius =  $\frac{1}{2}$  diameter". Mrs C read the questions in the book and also told Carl he'd be able to "have a go at it".

"Noooh" he moaned but at least he had his hat and coat off.

He pleaded with me. "I'll do something else. I'll do times."

I said, "Just sit there a minute while I get the others started".

They needed urging to get on with their circles. I drew circles for Stuart and Ned. Brett and Lenny were not skilled with compasses either but they persevered, their first efforts ending up crumpled in the bin.

I had a quick look through a Level 3 number book – but did not find anything inspiring – and gave Carl a multiplication square.

"I still can't do it!" He was becoming more and more agitated. "Look, why can't I do times? I asked nicely." How could I refuse?

"O.K. Do this." I got a stencil and drew 6 circles on a piece of paper, wrote on the diameter of the circles (whole numbers < 10) and underneath wrote  $3 \times 4 =$  etc.

While I was doing this at his table I explained that this was the 3 times table.

“I can’t do my 3 times”, he complained. I said, “Good” then he’d be learning something – and he could use the multiplication square. He was happy with this and I left him to fill in the answers, although watching him from a distance, I couldn’t help noticing that he did not look at the multiplication square before writing his answers.

“Finished that” he yelled across the room at me. All this had taken 20 minutes.

My response to Carl has been criticised as surrendering to his agenda (at BSRLM conference, 19.11.99) – a trade-off between teacher control and pupil compliance (on his own terms). I prefer to see it as a form of negotiation based on (long-standing) knowledge of the pupil. It is not appeasement; I have not simply bowed to his will, the process is more subtle. It means acknowledging his difficulty and meeting his emotional needs *through mathematics*.

Carl and I decided on a short-term plan towards the end of the summer term 2000. He chose a textbook, which I agreed was the right level for him and we discussed the exercises he would work on. He followed the plan for a week, except for the occasions when the whole class was involved in practical activities weighing objects. The plan provided him with a route for accessing mathematics, made easier by the relationship that I had developed with Carl.

Carl, by October 2000, was working at the same level as the rest of his class.

Children should be encouraged not to limit their own choices - in order to make a choice options must be made available (4.4.4 Limiting Choices).

### 5.2.9 Empathy

The importance of teacher-pupil relationships (also a *key finding*) cannot be overstated (3.6.4). The quality of *empathy* has already been mentioned (2.4.4 Psychodynamic Approach) but requires further discussion in the context of risk-taking and trust.

‘Being there’ is a kind of affirmation of the pupil. It is not exactly the same as empathy because one can distinguish between literally ‘being there’ and metaphorically ‘being there’. The former can be achieved solely through body language, the latter through enacting an appropriate relationship (eg. non-sexual). Here, the model I prefer with boys is mother-son but with girls is older sister-younger sister because I find it easier to make a connection on this level. A certain amount of tolerance (indulgence, even) is inferred by these relationships and the models typify the unconditionality necessary for the emotional health of the child. In a healthy relationship, parents confer unconditional love on the child but not acceptance of the child’s bad behaviour.

### 5.2.10 Socialisation

Linked to risk-taking is the issue of *socialisation*, which is a major aim of EBD schools (4.2.4 Stress and Stimulus). For the schools, it is about socialising the anti-social child so that society does not reject them when they leave school. One way of achieving this aim in the classroom is to advocate social methods of learning: collaborative pair work estimating time, interactive tasks conducting surveys or group work building structures out of paper (4.4.2 Mathematical Activity).

I associate this particular theme with a belief that the nature of learning for EBD

children in my classroom is essentially social: students (voluntarily) discuss questions, check and correct each other's work. There is a risk that one will decry another's efforts but it can be done in a good-natured way. One Year 11 boy's response has become a standing joke in his class - when asked to divide he invariably replies, "What's divide? Is it times?"

Social learning (4.6.2) is also a *key finding* in that it is supported by the evidence. It is, *prima facie*, the first conclusion to be drawn from the research, which could not be predicted before the research, as I had (at first) no impact on making it happen. In contrast, there were certain gender issues I tried to address, such as giving girls and boys equal attention in the classroom. Social learning fulfils the aim of socialisation.

### 5.3 CONCLUSION: DISTANCE AND PROXIMITY

It is central to my thesis that I actively work to reduce the emotional distance between a pupil and me in order to achieve the *feeling into* (Einfühlung) necessary to connect to the child's special need. The children are very needy and adults need to break down *some* of the barriers that the children have erected and maintain to protect themselves from harm and hurt. *Some*, not all, because all children need to understand the value of self-protection and the adult has a duty to maintain certain barriers for her own and the child's protection.

Sensitivity to a child's needs presents a risk in itself (to both adult and child) because of the nature of dynamic human relationships, which develop through reactions and responses to specific discourses. The vulnerability of both parties to the discourse should not be underestimated. The risk then becomes personal rather than strictly professional. To avoid crossing boundaries which should not be crossed, adults must let children know that their attachment to them is emotional not overly physical or sexual. I am arguing that in making



the emotional connection that is empathy, the adult brings an awareness of what constitutes the child's need based on knowledge of the child's biography. With that knowledge comes power which could be transformed into control over the child – a dangerous consequence – or empathy, which respects the child's right to share responsibility for her own behaviour.

As teachers we establish boundaries but they are not constant; they are tested continually and need re-establishing. *Being there* is about breaking down barriers but it is important to distinguish between physical and emotional barriers. Dissolving social/emotional barriers may lead to the testing of physical boundaries. On a personal level, this places me in a more vulnerable position and makes me more aware of the dynamics of a relationship with a young male. He may feel that social mores are open for exploration and become confused about what he is and is not allowed to do.

While reading about gender and mathematics (1994) I became interested in Walkerdine's interpretation of positioning within classroom discourses (Walkerdine, 1990). On 19.12.94

I wrote:

The boy walks into the classroom as an autonomous subject in his (own) discourse and, in order to take control in the classroom, I must position him as the powerless object in my discourse and usurp or take on power as the Teacher (subject). His power must be removed from him or given up by him in order for me to take control. He though, almost immediately, or at some point or various points during the lesson, removes the power base like a rug from under my feet by a simple action such as looking me up and down or looking at my legs under the table, which makes me feel like I'm standing on shifting sand. I can literally feel the

power taken out from under me or draining away from me as he positions me as the powerless female object in his sexist discourse.

What ensues then is a struggle in which I wrestle to retrieve power and reposition myself as the powerful subject in my discourse. How do I achieve this? By asking a question related to the lesson, for instance or by saying, “OK, listen...” to the whole class.

Coping with a child’s pain is a test of professional integrity. The ability to ‘read the signs’ is the test of any relationship. What does ‘testing a relationship’ mean? It takes time, patience, forgiveness and a lot of understanding to build a relationship of mutual trust and respect. A relationship built on trust can crumble at a moment’s notice. Often the effort appears to be purely one-sided and when the barriers are broken and defences fall, the need recognised by the child may not be welcomed.

Attending to the child’s emotional biography may offset any misunderstanding. I need to be clear about my function in any emotional relationship with a pupil – am I mother? Big sister? Teacher and nothing more? How do I perceive my role in loco parentis? To repeat, relationships are invariably dynamic – who has control of the direction in which a relationship is leading or is led? ‘Doing mathematics’ is a relationship; am I trying to alter this relationship, ie. the nature of doing mathematics? These are questions that are continually relevant in the classroom.

Five of the themes outlined above - **risk-taking, socialisation, flexibility, choice** and **empathy** – belong to a family of concerns about teaching mathematics to children with EBD. The major themes of the research revolve around the role of the teacher in the classroom (as opposed to pupil perspectives, for example). They are interdependent;

socialisation, flexibility, choice and empathy all involve an element of risk-taking.

Without security and trust, pupils with EBD cannot take risks in order to learn.

Even if the teacher attempts to maintain an emotional distance, eventually she tends to get sucked into the emotionally charged world in which she teaches, developing strategies and methods along the way. These may be coping strategies as much as teaching strategies. As soon as she becomes irritated by the behaviour of a child (or children) that child has made an emotional connection, albeit undesirable for the teacher. My aim ultimately is to make an emotional connection with each child through my actions in the classroom in the context of teaching mathematics.

In the next chapter, I bring together the themes, findings and principles in a conclusion to synthesise what I have learned into a set of messages about teaching mathematics to children with EBD.

## CHAPTER 6: CHALLENGE AND RESPONSE

### 6.1 INTRODUCTION

In this penultimate chapter, I summarise the main concepts arising from my research, which together represent a message to practitioners and an end to the journey begun in Chapter One.

When I started the research (in 1996) I had little notion of what I would find out about my practice in the particular field of mathematics and emotional and behavioural difficulties. However, I knew that there was very little literature written on teaching mathematics to EBD secondary pupils. Through my reading, I learned a lot about cognition and emotion, about the need to connect with emotions (empathy) in order to advance cognition skills in the child. Too much emphasis on managing behaviour at the expense of emotion is likely to mean a failure to connect with the child's emotions. However, this connection will also fail in the absence of trust between teacher and child. Trust is an essential part of the socialisation process, integral to the education of children with EBD.

### 6.2 THE CHALLENGING CLASSROOM

Children with EBD are often referred to without irony as 'challenging' because they represent a challenge to the traditional assumptions of education. Many teachers (and those outside education) view this as a euphemism – for children who will not do as they are told. Turning this concept on its head, from the child's point of view it is the school or classroom itself that is *challenging* as it represents a fearsome challenge to any child with low self-esteem and a lack of the social skills, which would otherwise

enable him to cope in this environment. Therefore, what is needed is a change in the way the teaching of children with emotional and behavioural difficulties is perceived. The teacher's role then is to reduce the challenging nature of the classroom, thereby reducing emotional and behavioural difficulties. The psychological means by which this can be achieved is the creation of a *comfort zone* between pupil and teacher, where each feels comfortable with what 'society' expects of them. Here the teacher acts as facilitator in raising the child's awareness of these expectations. The pupil is expected to raise his achievement and the teacher is expected to aid this process. The teacher must also be accountable publicly for the achievement of pupils, who must show evidence of progress in every lesson.

I have illustrated and developed the concepts of *challenging classroom*, *comfort zone* and *negotiated learning* in what is I hope sufficient detail to show that they are independent of me and my practice.

For the child, the *emotional* is more important than the *behavioural* because relationships between peers are the most challenging aspects of the classroom, more challenging than fear of failure in a mathematics task. We need to change the circumstances that the child finds oppressive but we cannot merely wait for success, we need to negotiate a response in the individual. If we see the classroom from the child's point of view as challenging and stressful, our job is to take the stress and challenge out of the classroom. Teachers need to be proactive, which is why research is needed on evaluation of interventions with children with EBD. There are no new solutions, only new ways of looking at the problem.

Taking George as an example (Ch.3, p.76), his case exemplifies negotiated learning and the development of a comfort zone, all within the context of the challenging classroom.

George's attitude can be summed up as, "I'll do it but you've got to 'be there' to make sure I don't fail". Instead of concluding that George was exhibiting challenging behaviour to me because he was refusing to work and, asking what action should I take in response to this refusal (ie. challenge to my authority) in order to make George conform, I should ask, "What is the challenge to George?"

My answer is, "the competition". To make this less challenging for him, I focus on what he can do, ie. multiplication. I do not immediately threaten punishment. I help George by allowing everyone to write remainders as whole numbers rather than decimals (which they find difficult). Most significantly for George, I present division as inverse multiplication. The success of removing the challenge was helped by George's basic need for attention and willingness (despite his words) to work. The emphasis is on managing the environment not on 'managing' George.

There is a connection between *comfort zone* and *being there* in that both describe a relationship rather than a place. *Being there* is an expression of affirmation, of acceptance. It is a way of finding that quality about oneself that enables one to engage fruitfully with pupils. That quality for me is encapsulated by the phrase 'feeling into' (Einfühlung), that is, the ability to see more than the behaviour when emotional and behavioural difficulties are presented by the child but to see behaviour as an event within the classroom discourse, framed as it is by the physical environment.

## ENVIRONMENT

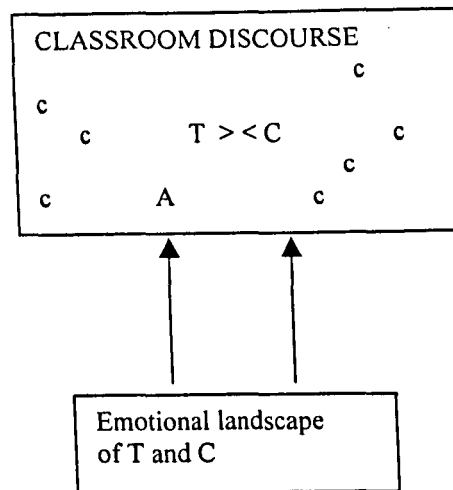


Figure 6.2 Classroom Discourse

In the diagram above, the teacher (T) and child (C) are the two interacting parties within the classroom discourse. The lower case 'c' represent the other children and 'A' the possible presence of another supporting adult. Both teacher and child bring their emotional landscape to bear on the interaction. By this I mean that each party has a distinct emotional background consisting of their particular vulnerabilities, defences and expectations, which have built up layer upon layer as a result of their affective experiences. The outcome of the behavioural event will depend on which aspect is to the fore at any given moment in time.

The immediate concern on a micro level is the expectations of the school community. The Head Teacher and other colleagues expect the teacher (recognisably) to teach mathematics. In other words, at any given moment the teacher should be seen to be teaching. On a wider macro level, Ofsted inspectors, county advisers, school governors, parents and teacher-educators expect a high standard of teaching and organisation of the mathematics curriculum. For the teacher to feel comfortable with so many external pressures (as well as taking account of the teacher's own intrinsic motivational factors)

requires a great deal of self-confidence and self-belief, through which pupils can reach the teacher. It is necessary for the teacher to feel at ease with her role before she can treat the pupils in the same way.

Pupils with emotional and behavioural difficulties have an even greater task. For them to feel comfortable with the expectations placed upon them (by teachers, parents and carers) requires trust in, and acceptance of, those around them and a secure place within the classroom environment. On the one hand, pupils are expected to conform and obey instructions. On the other hand, peer pressure to conform to a different behavioural model can be at least distracting, at most irresistible and a negation of the values advocated by the teacher. Pupils with EBD are influenced by external factors; lacking self-awareness as well as social awareness, they tend to regard a physical solution as the only (or best) option.

Through *negotiation* teacher and pupil find common ground so that no one feels under threat. Both teacher and pupil know that they have found this psychological meeting-place when they feel that they are doing something that pleases both parties and neither feels under pressure (from any quarter). Difficult to achieve but instantly recognisable when it is achieved; the *comfort zone* can be a transient phenomenon, whose state always needs renewing (usually directed by the teacher as the most self-aware person in the partnership).

### 6.3 SELF-KNOWLEDGE

The child who has learnt that he has little value makes no distinction between himself and that which he produces; it is axiomatic (to him) that if the latter has no value, neither does he. In order to unlearn this self-imposed conflation of 'me and mine' the



child must be able to separate his behaviours as actions and view them as others do, rejecting the undesirable phenomena whilst preserving a sense of self-worth. This requires a stable concept of the 'me' in relation to the 'not me'; emotional and behavioural difficulties arise from an immaturity in this relationship. Therefore, as a researcher I needed to view my story from the students' perspective, not just their responses to my questions.

Certain phrases in the field of EBD have become overused, I feel, particularly the notion of 'challenging children'. I could not make progress in my practice by regarding my students in this way. The 'label' is too aggressive and implies conflict. I do not agree that my role is to fight each child or attempt to rise to the challenge that they present. Taking the children's perspective, I can see that each time they enter my classroom it is a challenge to them - they are being asked to meet certain expectations and it is frightening for them. In placing the site of the challenge in the classroom, the role of the environment – and my place in it – becomes a crucial means for me to obviate the challenge. Instead of focusing my efforts on managing the behaviour of the children, I try to manage the forces that interact with the children. This is a complex undertaking because there is more than one child in the classroom but managing the environment sends a message to the children about the source of control and security, which reduces the perceived challenge. Each time they return to the classroom with an unknown (to me) psychological/emotional state, the message needs restating.

From my research, it is clear that I value the relationships between children and adults in the classroom and the meaning that they bring to these relationships. As their teacher, I cannot connect with their emotional needs unless I acknowledge my own emotional vulnerability. I have learned that I want to achieve a good relationship with my pupils, in the sense that they understand that I am there for them, working for

their success in mathematics.

#### 6.4 APPLICATION TO PRACTICE

The inclusion debate centres naturally enough on the individual needs of the child. Withdrawal to a special school for a limited period where the child's emotional needs can be met and then he or she can be returned to mainstream has the resonance of a health 'cure' and assumes that the child can be made 'better'. In my experience, the children who attend an EBD school feel more secure and want to be there, though here the law of diminishing returns applies as the older a child is on transfer the less secure he will feel in his new environment. Some children find that they thrive in a special school where they meet (perhaps for the first time) consistent success.

Therefore, I have to assume that the best practice for children with EBD occurs in a place separate from the mainstream for such time as is necessary to overcome the emotional difficulties that coexist with behavioural problems. Mathematics has a place in this process and can bring success to most children with EBD. They can find a way forward through mathematics unencumbered by demands placed on their literacy skills.

On a personal level, my research can be summarised as a continuously evolving relationship between my practice and reflecting upon my practice. Each time I reflect it changes my practice because I learn something about myself, even though I make no conscious effort to change. When I then reflect upon the changed practice, this brings about further change as I continue to learn more about myself as a practitioner.

The validity of my theory comes from its practical application, placing it within reach of practitioners in the EBD mathematics classroom. The key findings espoused in Chapter

Four - children with EBD are social learners, respond to increasing stimuli, find mathematics relatively accessible and value relationships with teachers – can be validated by comparison with other teachers' classrooms. Indeed, teachers in other EBD classrooms and in mainstream schools may find some relevance in the findings to their own practice. These are not so much deeply held beliefs (although they remain at the core of my teaching) as an approach to the possibilities accruing from the dynamic relationships that constitute the creation of practice. My theory is not propositional or prescriptive. It is creative without putting at risk the position of my beliefs. I present a way of working on one's own practice: a process of enquiry that others might follow, although their journey will be their own.

Looking back at the end of this period of research, certain assumptions run through the research, which possibly need to be challenged further. One is that I can reduce the emotional context of mathematics while increasing the social context, which is, in practice, a difficult task. This needs to be tested by other mathematics teachers. I attest that the point of connection to the child is made through mathematics as number can be regarded as 'emotion-free'. Again, other researchers may challenge this assertion.

There still needs to be more practice-based research in teaching mathematics to pupils with EBD. As more is discovered about this field, more concepts will emerge that enlighten the teaching of mathematics to children with EBD.

## **6.5 LIMITATIONS OF THIS WORK**

Looking back over the six-year period of this enquiry and attempting to bring it to articulation, I can see now that for the enquiry to be repeated by another researcher in a similar vein, there are some lessons to be learned.

If I were to repeat the study, I would place more emphasis on pupil-directed research, such as pupil diaries and recordings. I do not feel that these were successful in showing an emotional connection to me or to mathematics, although they were successful in revealing behavioural difficulties in teaching and learning. For instance, I would give every pupil in the class (not just one or two) the chance to complete a diary of their mathematical and classroom experiences. I could place a class diary open on my desk every lesson for those who wanted to comment on the lesson.

I would make more opportunities for triangulation by showing short excerpts of video-recordings (rather than a whole lesson) to a class and classroom assistant. This would give the participants an opportunity to direct the research through their interpretations.

I would also research other subjects, such as English, to find out if pupils' experiences differed significantly from those that I had discovered in mathematics. Other teachers of pupils with EBD may have a perspective that is worth noting and comparing to mine.

## **6.6 FUTURE DEVELOPMENT**

As already indicated, this thesis reports on a period of enquiry that is, by its very nature, ongoing. Although it was not my intention, if others find value in my articulations, prompting them into similar enquiry, it would be gratifying to know that they too are probing more deeply into themselves, their environment and the lived experience of the children they teach. There is no single way to teach mathematics to children with EBD, no secure route to gaining the trust and respect of children or, to guarantee a mutual liking between teacher and child. However, I shall continue to learn from my experiences with children. The thesis itself can be seen almost as a 'working document', which can be updated as developments arise in my practice. It is a testament to a living

theory: 'living' in the sense that it represents a period of my working life but also, in the sense that it is evolving continually.

## 6.7 AN END TO THE JOURNEY

In the sense that my research is ongoing, I cannot present my thesis as *the* end to the journey. However, I can present the essence of the thesis distilled from the preceding account. Although I am not able to generalise from my research, as it is highly personal, I refer to myself as 'the teacher' in the following text.

I start from the premise that there is no abnormality in the child – a refutation of any deficit theory. As a teacher I deal with the difficulties presented by the child. A major factor in those difficulties is the classroom ecology (or environment) in which the teacher is a powerful presence. The teacher's objective is to include the child as an interacting part of the ecology. The onus is then on the teacher to make it happen. Special School teachers tend to have more control over the teaching/learning environment than their mainstream colleagues – there is invariably only one mathematics classroom.

The classroom is a site of potential stresses, which the teacher must identify – pupil interactions with the teacher, other pupils and learning support assistant, the seating arrangements, lesson structure, lesson objectives, equipment – to make it as easy as possible for the child to behave. The most important area is the relationship between teacher and child built on (mutual) liking, trust and empathy. The teacher should ensure that she can do what she requires the child to do, not only in the sense of mathematics but with organisational matters like where to sit and classroom rules and routines.

Using empathy and an understanding of how I learn, I believe that visual stimuli encourage learning. I want my pupils to walk into a room that is 'busy', where they meet examples of the different kinds of mathematics with which they could engage. (To this end, displays should be changed regularly to maintain interest.)

To summarise, children with EBD are not a different type of learner, the teacher does not exist in a separate world of learning from the pupils and is not the centre of knowledge in the classroom. Mathematics is best learned socially, where pupils can justify their answers or explain their conjectures to each other, which involves discussion and argument. This requires a level of risk-taking on the part of the teacher who is mainly concerned with control. I do not accept the phenomenon of the challenging child with attention-seeking behaviour – it is the classroom that is challenging and the child who needs attention.

Taken from this perspective, the teacher asks a different set of questions: instead of, "What rewards and sanctions can I use to modify behaviour?" the question becomes, "How can *I* change or change the classroom in order to reduce the challenge?"

## CHAPTER 7: FURTHER REFLECTIONS

### 7.1 INTRODUCTION

This final chapter reflects back on the study and considers the position of the thesis in the broader context of existing work in the field of teaching pupils with EBD, and the definitions currently in use. I also consider the account of my journey in the context of discussions concerning the epistemological and methodological bases for enquiries such as this.

### 7.2 THEORETICAL PERSPECTIVES

At the end of my journey, it is appropriate to reflect on where the thesis as a whole stands in relation to some specific theoretical perspectives, which at the time of the research were not considered to be centrally significant.

#### 7.2.1 The Therapeutic Tradition

Although therapeutic education dates back to the mid-nineteenth century, three important writers in this tradition – AS Neill, David Wills and Robert Laslett - developed their ideas from the 1920s through to the 1970s (Bridgeland, 1971; Laslett, 1977).

AS Neill founded Summerhill in 1924 to give expression to his (primarily Freudian) psychological principles: of the power of freedom, love, trust, lack of sexual repression and moralising to change the ‘problem child’ (Bridgeland, *ibid*: 136). Although the school was not established for maladjusted children, it did attract many children who we now regard as presenting emotional and behavioural difficulties. The term *maladjusted* had no statutory

definition until the 1945 Ministry of Education regulations on handicapped pupils, when it was taken to mean a failure to adjust, exhibiting as emotional instability or psychological disturbance necessitating special educational treatment (see 7.3). For Neill the maladjusted were made angry due to a lack of love. In a simplistic sense, this is what I mean by 'poverty of care' (p.10) – an inability on the part of the parent to nurture the child.

Summerhill was, and is, famously self-governing and non-coercive, where lessons are not compulsory. Neill eschewed educational theories as part of his rejection of authority; in fact, he claimed not to be interested in education. Each child develops through the expression of his inner desires - free from censure or punishment, self-regulated according to his needs - into a happy and good person. Such emphasis on freedom from restrictions does not mean total anarchy as rules do exist as made by the General School Meeting, where adults and children have equal say. Although Neill goes beyond Freud, he is essentially concerned with the preservation of a healthy 'id' rather than the development of a strong 'ego'. Today's emphasis on 'boundaries' appears to represent the opposite end of the therapeutic continuum, yet early years' intervention is acknowledged to be more preferable in preventing emotional and behavioural difficulties than later attempts at 'cures' (Bennathan & Boxall, 2000).

For David Wills, faith, love, work and shared responsibility were essential to his particular brand of psychotherapy (Bridgeland, 1971). Wills was motivated by his faith as a Christian. Approval and acceptance of the child (but not the bad behaviour) were central to Wills' therapeutic approach. 'Shared responsibility' differs from self-government in that it is dynamic. At Hawkspur Camp, where Wills worked and which ran from 1936-1940, adults and children had an equal vote but the children had to impose their own self-discipline. It was similar to Summerhill in that the adults would not discipline the children. In 1940 Wills continued his approach at the Barns Evacuation Hostel, where punishment



was rejected as militating against a loving relationship between staff and child. Here the child must feel that the adult values him, no matter what, in order for therapy to begin working. Wills regarded 'maladjustment' to be a result of early deprivation and maltreatment, causing an inability to form relationships and acquire moral standards. The 'cure' was moral re-education. Wills' emphasis on the importance of forming a relationship between adult and child as a basis for the child's normal development resonates with my own experience. My concern was to develop this further in the context of mathematics.

Wills went to Bodenham Manor (a school for maladjusted boys and girls aged eight to sixteen) after the war until 1961. Robert Laslett worked with him there, which necessarily influenced his thinking when he co-founded the New Barns Therapeutic Community in the 1960s and became headteacher at Aston Special School. His account of theory and practice in 'Educating Maladjusted Children' (1977) favours therapeutic approaches, although he was concerned that teachers were informed about other approaches too. For Laslett, teachers needed to look behind the behaviour in order to educate difficult children in a positive way. My discovery (for myself) of this requirement represents one of the many shifts in my practice along my journey. Even though I had read Laslett early on, it did not resonate at the time with my early experience.

Laslett observed that for many their home environment:

“...threatens to overwhelm them. Some of them have been involved in situations where relationships have been destroyed by the eruption of hostile and violent feelings. They have not been responsible for that destruction but caught up in it and they have fantasies about the power of their own hostility.” (Laslett, 1977: 76)

Therefore, school life needs to provide stability in the form of a predictable environment with reliable adults. Laslett advocated limiting behaviour without imposing too many restrictions. In this way, he can be seen as a half-way point between the freedom of AS Neill and the mixed approaches of today's EBD schools.

### **7.2.2 Rogerian Psychology**

Carl Rogers (1983) is the author of a 'person-centred approach', which has echoes in certain themes of my thesis (which evolved over time), particularly 'trust' and 'empathy'. Rogers saw the teacher as a 'facilitator of learning' who could help disturbed students to develop self-insights by trying to understand how the student feels from the inside. This deep empathic understanding combined with a warm, loving acceptance of the person enables the student to resolve internal distress, to grow and become independent. Teachers start with the needs and interests of the student, asking the question, "What does the young person want to learn?" Teachers must be flexible in enabling the student to make choices and take risks in relinquishing control and expressing their own feelings in the classroom. In this way feelings become a part of the classroom experience. Students initiate their own learning experiences and use self-evaluation – 'the locus of evaluation' no longer lies outside the self. Hence, the 'freedom' experienced is inner, subjective and existential. As Rogers observes, these are high ideals and difficult to actualise. In the thesis I have recorded my development, which can be seen as an experiential lived reality of Rogers' expressed ideals. The ideals emerge from systematic enquiry into lived experience.

### **7.2.3 Cognitive Behaviourism**

Cognitive behaviourism links mental processes to social behaviour, suggesting that human beings actively select stimuli, construct meanings and make sense of their worlds

(Marshall, 1994). However, responses can be modified by external factors, such as rewards. Cognitive behavioural therapy helps the child to identify and systematically challenge the irrational thoughts and feelings relating to poor self-esteem and disturbed behaviour (Cooper, 1999). The aim is for the child to become self-managing and self-reinforcing. I have found that children can become self-directing in their learning of mathematics (as well as in the area of behaviour), given the teacher's ability to be flexible in her approach.

#### 7.2.4 Attribution Theory

Weiner's *attributional theory of motivation and emotion* (1986) describes a temporal motivational sequence initiated by the outcome that the person interprets as either positive (goal attainment) or negative (non-attainment). A primary appraisal of happiness or sadness instigates a causal search to determine why the outcome occurred. The resulting affective reaction and location of the cause in dimensional space is determined by locus, stability and controllability, which are in turn dependent on the phenomenology of the perceiver. To give an example, 'lack of ability' can be seen as internal, stable and uncontrollable, which leads to an expectancy of future failure, lower self-esteem and the self-directed affective consequence of shame.

In attribution theory causes are constructed in answer to 'why?' questions by the attributor to account for the relation between action and outcome. Questioning the outcome may produce reasons for, and responsibility for, the behaviour. Attributions are often time and situation dependent rather than properties of individuals. As a theory of motivation attribution theory is based on general laws not individual differences, which distinguishes it from Rotter's social learning theory and concept of 'locus of control' (cited in Weiner, *ibid*).

The *internal locus of control* refers to the extent to which the individual perceives that reward is contingent on his own behaviour or attributes. A conflict exists here with how far the individual perceives that reward is controlled by external forces, independent of his own actions. For Weiner, locus of control is a useful concept in locating where causes are perceived on an internal-external continuum. However, he identifies two independent causal properties, labeled 'locus' and 'control' – a cause might be internal yet uncontrollable. To Rotter aptitude is perceived as an internal control, whereas Weiner states that aptitude is often seen as genetically inherited and, therefore, not controllable. Earlier in the thesis I discuss locus of control in respect of the self-concept and relationships in the classroom – an internal locus of control supports a more positive self-concept.

### 7.3 DEFINITIONS OF EMOTIONAL AND BEHAVIOURAL DIFFICULTIES

Theories of emotional and behavioural difficulties differ in terms of causation and presenting factors. A formal definition of the term *emotional and behavioural difficulties* superseded that of the term *maladjusted* in 1989 (DES cited in Cooper et al, 1994). This reflected a move away from the therapeutic towards a more behaviourist, strategic approach to the child's needs. The official definition describes:

“...children who set up barriers between themselves and their learning environment through inappropriate, aggressive, bizarre or withdrawn behaviour” who “have developed a range of strategies for dealing with day-to-day experiences that are inappropriate and impede normal personal and social development, and make it difficult for them to learn.” (Cooper et al, 1994: 20)

Here, cause (or blame) is placed within the child, ignoring the social context of family and school. Implicit in a behaviouristic approach is the belief that behaviour can be changed by manipulating the consequences of behaviour or changing the situation in which it occurs. Thus, it does not really matter what caused the child to 'put up barriers' in the first place. In my experience, it is not helpful to place responsibility for behaviour solely on the child because the child is responding to his own interpretation of the situation in which he finds himself.

Hallahan & Kauffman (1991) cite four reasons for the incidence of emotional and behavioural difficulties:

- biological factors
- the family
- cultural factors
- the school.

These 'causes' present themselves in the child in six dimensions, which are not mutually exclusive:

1. conduct disorder – attention-seeking, disruptive, fighting
2. socialised aggression – steals with others, truants
3. attention problems – poor concentration, lethargy
4. anxiety – withdrawn, self-conscious, hyper-sensitive, depressed
5. psychotic – bizarre behaviour, repetitive speech
6. motor excess – restless, tense, overtalkative.

This appears to me to be a comprehensive overview of emotional and behavioural difficulties. In my view, 'poverty of care' places the cause mainly in the family and I have seen all of the above behaviour exhibited within school. School can make a big difference,

as my experience has shown. It was my belief that a teacher can make a difference that provided the impetus for my thesis.

## 7.4 METHODOLOGY

Within the earlier chapters of the thesis I have presented my epistemological and methodological assumptions as they arose from the development of my personal research. Here, in this section, I review these from the standpoint of different concepts of reality, objectivity/subjectivity, where my research is situated in terms of other research paradigms and the criteria for judging the quality of this type of work.

### 7.4.1 Epistemological Assumptions

In the early days of the research I perceived my approach to be essentially phenomenological, believing that pupils' experience of the world is constituted in and by consciousness. As a researcher, my task is to construct a rational model of their social world based on the (first-order) theories, which pupils offer to explain their own activities (Marshall, 1994). Interviews and questionnaires give access to these first-order theories. In this sense, describing a situation is the same as creating it. When exploring the motives for actions, I can distinguish between 'because' motives, which lie in past experience, from 'in order to' motives, which point to a future state of affairs that the pupil wants to bring about. I wanted to uncover 'intersubjective meanings' of the participants as a substitute for objectivity. I hoped that we could come to a mutual agreement about interactions and events.

Intersubjectivities represent one form of reality and belong to the constructivist paradigm.

Another view of reality or 'what is observed' is for all observers to share the same

theoretical framework (Phillips, 1990). However, it is not enough to claim objectivity through group consensus.

“A view that is objective is one that has been opened up to scrutiny – to vigorous examination, to challenge.” (Phillips, 1990: 30)

In this sense, objective does not mean true. For Phillips, all inquirers are trapped within their own paradigm – they will judge events as being true for them but others in their paradigm will judge it false for them, so that objectivity is necessarily relative. As researchers are part of the social worlds they study, knowledge cannot be separated from the knower.

As it developed, my own approach is not based on subjects' own interpretation of reality but on my interpretation of their perceptions and actions, which, although overtly subjective, is subject to ongoing scrutiny for 'fit' with subsequent experience and for 'informing' future actions (Mason, 2002). Objectivity is achieved through seeking resonance with colleagues. This differs from the *interactionist* perspective, which regards interviews as reports revealing underlying external realities because interviewees are actively constructing their social worlds and revealing their authentic experiences (Silverman, 1993). I found that interviewees project a reality that is true for them at the time but which is jointly constructed with the interviewer by way of the setting, the questions asked and the interviewees' interpretation of the purpose of the interview. Comments in interviews do not always concur with observation. By contrast my diary accounts seek to record my experience of learners' behaviour. What learners say about those incidents provides context for my experience as data. Furthermore, my experiences necessarily colour my interpretation of what was said in interviews.

### 7.4.2 Quality Criteria

Earlier I have discussed the quality of my work using the concept of validity. However, in a personal account it may be more appropriate to discuss other related concepts. Lincoln and Guba (1985) make a case for rejecting conventional criteria such as validity and generalisability where qualitative data are concerned. Instead, they suggest that it is possible to establish the trustworthiness of such data with reference to four alternative quality criteria: credibility, transferability, dependability and confirmability. Credibility is the parallel construct to internal validity and requires the researcher to demonstrate that the subject of the enquiry was accurately identified and described. Transferability (rather than generalisability) is ensured by providing a 'thick' enough description to allow another person to transfer the data to their own situation or, in my case, to recognise elements of their own experience in my descriptions. Dependability goes hand in hand with credibility and can be achieved through triangulation, for instance, as a safeguard against bias. The use of triangulation has increased the dependability of my own study, where pupils and classroom assistant viewed videotapes and discussed what they saw and recalled. I have also gone further, presenting my findings at conferences in order to seek resonance with colleagues' experience. Lastly, confirmability (as opposed to scientific objectivity) ensures that enough evidence has been provided to judge the adequacy of the processes used and the connection between the findings and the data. In such a personal account, where scientific objectivity is not an aim, I have shown how my interpretation of the data gives rise to certain themes and findings.

'Authenticity' can be found in the reader's interpretation of the text, as it is so personal, allowing insights into the experience of doing this kind of enquiry. More than 'thick' descriptions, I provide an account of the personal journey around those descriptions.



## 7.5 CONCLUSION

The constructs that I discovered to be existent within my practice – trust, empathy, flexibility and risk-taking – position my thesis amongst a child-centred, therapeutic and cognitive-emotional paradigm of learning and teaching within the field of emotional and behavioural difficulties. My thesis goes much further, demonstrating the kinds of insights and personal development that can arise through systematic enquiry. Those insights can only become significant when they are based on personal experience, although they may be confirmed by reading the works of others. Of paramount importance is a mutually rewarding relationship between teacher and pupil based on the stated constructs, which advance both the teacher's practice and the pupil's learning.

## APPENDIX 1

**Interview Schedule: 12.5.97**

**Name:**

Introduction

(To be read out by interviewer)

I'm doing research for a higher degree in education. I'm looking at how pupils learn maths and what they think of the maths they do. I'd like to ask you some questions so that we can find out how you learn maths and how you feel about maths. O.K?

We're going to start with your views on what maths is. Let's look at your list of all the things you do in maths lessons.

Questions

1. Do you think maths is all those things?
2. Is there anything you think is not maths? Why not?
3. Is there anything you think you should do in maths lessons that is not on your list?
4. Which of those things do you think is most important for you to learn?
5. Does this list tell you what *I* think is most important to learn? If so, what?

6. Are you ever surprised by what I ask you to do in maths lessons?
7. Do I ever do anything in the lesson that you think is not real maths?
8. Have your views on what maths is changed since I became your teacher?

Let's look at the lesson we've just had.

9. How were you feeling when we started the lesson?
10. Had your feelings changed by the end of the lesson?
11. Do you think it's useful to learn.....? Why?
12. Why might I think it's useful for you to learn.....?
13. How much of it did you understand?
14. Do you usually understand a new idea in maths quickly?
15. Do you usually get most of your maths right?

## REFERENCES

- Ainley J (1988) Playing games and real mathematics in: Pimm D (Ed) Mathematics, Teachers and Children, London, Hodder & Stoughton.
- Barnett M (1987) Empathy and related responses in children in: Eisenberg N and Strayer J Empathy and Its Development, Cambridge, CUP.
- Bennathan M (2000) What do we mean by 'EBD'?, AWCEBD Newsletter, Summer: 1-3.
- Bennathan M & Boxall M (2000) Effective Intervention in Primary Schools, London, David Fulton Publishers.
- Bennathan M (2001) How we think about children, AWCEBD Newsletter, Summer: 1-3.
- Bijou SW and Baer DM (1978) Behavior Analysis of Child Development, New Jersey, Prentice-Hall Inc.
- Boaler J (1994) When do girls prefer football to fashion?, British Educational Research Journal, 20, 5: 551-564.
- Borasi B and Rose B (1989) Journal writing and mathematics instruction in: Educational Studies in Mathematics, 20, 4, Kluwer Academic Publishers.
- Bowers T (1996) Putting the 'E' back in 'EBD', Emotional and Behavioural Difficulties, 1,1.
- Bridgeland M (1971) Pioneer Work with Maladjusted Children, London, Staples Press Ltd.
- Buxton L (1981) Do You Panic About Maths?, London, Heinemann Educational.
- Cambone J (1994) Teaching Troubled Children, New York, Teachers College Press.
- Canter L and Canter M (1992) Assertive Discipline, Santa Monica, CA, Lee Canter & Associates.
- Carr W and Kemmis S (1986) Becoming Critical, London, Falmer Press.
- Chapman O (1993) Women's voice and the learning of mathematics, Journal of Gender Studies, 2, 2: 206-222.
- Clarke R (1988) Gestalt therapy, educational processes and personal development in: Pimm D (Ed) Mathematics, Teachers and Children, London, Hodder & Stoughton.
- Clausen T (1991) Mathematics therapy, Mathematics Teaching, 136.
- Cockcroft WH (1982) Mathematics Counts: Report of the Committee of Enquiry into the Teaching of Mathematics in Schools, London, HMSO.
- Cole T, Visser J and Upton G (1998) Effective Schooling for Pupils with Emotional and Behavioural Difficulties, London, David Fulton.
- Coleman J (2001) Self-esteem: towards a better understanding, Young Minds, 51: 18-19.

Cooper P (Ed) (1999) Understanding and Supporting Children with Emotional and Behavioural Difficulties, London, Jessica Kingsley.

Cooper P, Smith CJ and Upton G (1994) Emotional and Behavioural Difficulties, London, Routledge.

Cooper P and Upton G (1992) An ecosystemic approach to classroom behaviour problems in: Wheldall K (Ed) Discipline in Schools: Psychological Perspectives on the Elton Report, London, Routledge.

Coopersmith S and Feldman R (1974) Fostering a positive self concept and high self-esteem in the classroom in: Coop R and White K Psychological Concepts in the Classroom, New York, Harper & Row.

Crawford K (1995) What do Vygotskian approaches to psychology have to offer action research?, Educational Action Research, 3, 2.

Daniels H (2001) Activity theory and knowledge production in: Emotional and Behavioural Difficulties, 6, 2: 113-124.

Daniels H, Visser J, Cole T and de Reybekill N (1999) Emotional and Behavioural Difficulties in Mainstream Schools, London, HMSO.

De Charms R (1976) Enhancing motivation, New York, Irvington Publishers.

DES (1989) Discipline in Schools: Report of the Committee of Enquiry (The Elton Report), London, HMSO.

DfEE (1999) Mathematics: The National Curriculum for England, London, HMSO.

DfEE (2002) Special Educational Needs Code of Practice, London, HMSO.

Dupont H (Ed) (1975) Educating Emotionally Disturbed Children, New York, Holt, Rinehart and Winston.

Eddowes M (1983) Humble Pi: The Mathematics Education of Girls, Harlow, Longman.

Ekman P and Davidson RJ (1994) The Nature of Emotion, Oxford, Oxford University Press.

Elliott J (1987) Educational theory, practical philosophy and action research, British Journal of Educational Studies, 35, 2:149-155.

Elliott J and Adelman C (1976) Ford Teaching Project, Cambridge, Cambridge University Press.

Eraut M (1995) Schön shock: a case for reframing reflection-in-action?, Teachers and Teaching: Theory and Practice, 1, 1, Abingdon, Carfax Publishing Company.

Farrell P (Ed) (1995) Children with Emotional and Behavioural Difficulties, London, Falmer Press.

Fensham P (Ed) (1986) Alienation From Schooling, London, Routledge & Kegan Paul.

Frijda N (1986) The Emotions, Cambridge, Cambridge University Press.

Garner P (1993) What disruptive students say about the school curriculum and the way it is taught, Therapeutic Care and Education, 2, 3: 404-15.

Glynn T (1986) Antecedent control of behaviour in educational contexts in: Wheldall K, Merrett F and Glynn T (Eds) Behaviour Analysis in Educational Psychology, London, Croom Helm.

Gray J and Richer J (1988) Classroom Responses and Disruptive Behaviour, London, MacMillan Education.

Green K (1993) Diary writing in a mathematics education class in: Plummer J and Edwards G Dimensions of Action Research: People, Practice and Power, Bournemouth, Hyde Publications.

Greenhalgh P (1994) Emotional Growth and Learning, London, Routledge.

Gurney PW (1988) Self-Esteem in Children with Special Educational Needs, London, Routledge.

Hall C and Hall E (1988) Human Relations in Education, London, Routledge.

Hallahan and Kauffman (1991) Exceptional Children, London, Simon and Schuster.

Harris M (1997) Mathematics for all?, Mathematics Teaching, 161: 2-10.

Hewett FM (1968) The Emotionally Disturbed Child in the Classroom, Boston, Allyn and Bacon Inc.

Howson G and Wilson B (1986) School Mathematics in the 1990s, Cambridge, Cambridge University Press.

Irvine B (2000, unpub.) David Wills Lecture, London.

Jaworski B (1988) 'Is' versus "seeing as": constructivism and the mathematics classroom in: Pimm D (Ed) Mathematics, Teachers and Children, London, Hodder & Stoughton.

Jaworski B (1994) Investigating Mathematics Teaching, London, Falmer Press.

Jaworski B (1995) The critical nature of teaching decisions, Mathematics Teaching, March, Association of Teachers of Mathematics.

Kemmis S and McTaggart R (Eds) (1982) The Action Research Planner, Victoria, Deakin University.

Laslett R (1977) Educating Maladjusted Children, London, Granada.

Lave J (1992) Word problems: a microcosm of theories of learning in: Light P and Butterworth G (Eds) Context and Cognition, London, Harvester Wheatsheaf.

Lazarus R (1991) Emotion and Adaptation, New York, Oxford University Press.

Lerman S (1994) Changing focus in the mathematics classroom in: Lerman S (Ed) Cultural Perspectives on the Mathematics Classroom, Dordrecht, Kluwer Academic Publishers.

Lerman S and Scott-Hodgetts R (1991) Critical incidents in classroom learning – their role in developing reflective practice, PME Conference Proceedings, II.

Lincoln YS and Guba EG (1985) Naturalistic Inquiry, London, Sage.

Lomax P (1999) The significance of action research and self study for evidence-based professionalism and the development of community, BERA NEI Seminar, University of Bath.

Long B (1975) A model for elementary school behavioural science as an agency of primary prevention in: Dupont H (Ed) Educating Emotionally Disturbed Children, New York, Holt, Rinehart and Winston.

MacMillan DL and Forness SR (1975) Behavior modification in: Dupont H (Ed) Educating Emotionally Disturbed Children, New York, Holt, Rinehart and Winston.

Marshall G (Ed) (1994) The Concise Oxford Dictionary of Sociology, Oxford, Oxford University Press.

Mason J (1980) When is a symbol symbolic?, For the Learning of Mathematics, 1,2: 8-12.

Mason J (1994) Salient moments and critical incidents, Journal of Teacher Development, 3, 3, Longman Group Limited.

Mason J (2002) Researching Your Own Practice: The Discipline of Noticing, London, RoutledgeFalmer.

Mason J and Pimm D (1986) Discussion in the Mathematics Classroom, Milton Keynes, Open University Press.

Mason J and Spence M (1999) Beyond mere knowledge of mathematics: the importance of knowing-to act in the moment, Educational Studies in Mathematics:135-161.

McKernan J (1996) Curriculum Action Research, London, Kogan Page.

McNiff J (1988) Action Research: Principles and Practice, London, MacMillan Education Limited.

McNiff J, Lomax P and Whitehead J (1996) You and Your Action Research Project, London, Routledge.

Mellor N (2001) Messy method: the unfolding story, Educational Action Research, 9,3.

Mercer N (1992) Culture, context and the construction of knowledge in the classroom in: Light P and Butterworth G (Eds) Context and Cognition, London, Harvester Wheatsheaf.

Mongon D and Hart S (1989) Improving Classroom Behaviour: New Directions for Teachers and Pupils, London, Cassell.

Nicodemus R (1993) Transformations, For the Learning of Mathematics, 13,1: 24-27.

- Otto A and Kanga SN (1995) Doing educational research: an action research approach, Educational Action Research, 3, 3.
- Phillips DC (1990) Subjectivity and objectivity: an objective enquiry in: Eisner EW & Peshkin A Qualitative Inquiry in Education, New York, Teachers College Press.
- Pierce C (1994) Importance of classroom climate for at-risk learners, Journal of Educational Research, 88, 1: 37-42.
- Pik R (1987) Confrontation situations and teacher support systems in: Cohen L and Cohen A Disruptive Behaviour, London, Harper & Row.
- Polyani M (1964) Personal Knowledge: Towards a Post-Critical Philosophy, New York, Harper & Row.
- Porter L (2000) Behaviour In Schools, Milton Keynes, Open University Press.
- Poulou M (2001) The role of vignettes in the research of emotional and behavioural difficulties, Emotional and Behavioural Difficulties, 6, 1: 50-62.
- Power M and Dalgleish T (1997) Cognition and Emotion: From Order to Disorder, Hove, Psychology Press.
- Richmond T (1993) Making learning flexible, British Journal of Special Education, 20, 1: 20-3.
- Robinson J & Norris F (2001) Generalisation: the linchpin of evidence-based practice?, Education Action Research, 9,2.
- Rodgers C (1983) Freedom To Learn For The 80's, Ohio, Merrill Publishing Company.
- Salmon P (1995) Psychology in the Classroom, London, Cassell.
- Salzberger-Wittenberg I, Henry G and Osborne E (1983) The Emotional Experience of Learning and Teaching, London, Routledge & Kegan Paul.
- Silverman D (1993) Interpreting Qualitative Data, London, Sage Publications.
- Silverman D (2000) Doing Qualitative Research: a Practical Handbook, London, Sage.
- SMP (11-16) (1987) Book G7, Cambridge, Cambridge University Press
- SMP (11-16) (1985) Book Y1, Cambridge, Cambridge University Press.
- Solomon D and Oberlander M (1974) Locus of control in the classroom in: Coop R and White K Psychological Concepts in the Classroom, New York, Harper & Row.
- Strayer J (1987) Affective and cognitive perspectives on empathy in: Eisenberg N and Strayer J (Eds) Empathy and Its Development, Cambridge, Cambridge University Press.
- Sulzer-Azaroff B and Mayer GR (1977) Applying Behavior-Analysis Procedures with Children and Youth, New York, Holt, Rinehart and Winston.



- Sutherland R (1993) Consciousness of the unknown, For the Learning of Mathematics, 13,1: 43-46.
- Tahta D (1996) Mind, matter and mathematics, For the Learning of Mathematics, 16, 3.
- Tattum DP (1982) Disruptive Pupils in Schools and Units, Chichester, John Wiley & sons.
- Thom R (1973) Modern mathematics: does it exist? in: Howson AG (Ed) Developments in Mathematical Education, Cambridge, Cambridge University Press.
- Trickett L and Sulke F (1988) Low attainers can do mathematics in: Pimm D (Ed) Mathematics, Teachers and Children, London, Hodder & Stoughton.
- Tripp D (1993) Critical Incidents in Teaching, London, Routledge.
- Vickers KM & Tipler MJ (1995) New National Curriculum Mathematics, London, Nelson Thornes.
- Vygotsky LS (1978) Mind in Society, Cambridge, Mass., Harvard University Press.
- Walker R (1985) Doing Research, London, Methuen.
- Walkerdine V (1990) Schoolgirl Fictions, London, Verso.
- Weil-Kayley L (1985) Victoire Sur Les Maths, Paris, Robert Laffont.
- Weiner B (1986) Attributional Theory of Motivation and Emotion, New York, Springer-Verlag.
- Westwood P (1987) Commonsense Methods for Children with Special Needs, London, Croom Helm.
- Wheldall K (Ed) (1992) Discipline in Schools, London, Routledge.
- Wheldall K and Merrett F (1992) Effective classroom behaviour management: positive teaching in: Wheldall K (Ed) Discipline in Schools, London, Routledge.
- Whitehead J (1989) Creating a living education theory from questions of the kind, "How do I improve my practice?", Cambridge Journal of Education, 19, 1.
- Williams A (1985) Towards success in mathematics in: Smith C (Ed) New Directions in Remedial Education, London, Falmer Press.
- Wilson D (1994) The transference relation in teaching, Chreods, 8.
- Wilson M and Evans M (1980) Education of Disturbed Pupils, London, Methuen Educational.
- Winnicott DW (1971) Playing and Reality, Harmondsworth, Penguin.
- Wright E (2001) Using nurture group principles with statemented EBD pupils, AWCEBD Newsletter, Summer: 10.

Wolff S (1969) Children Under Stress, Harmondsworth, Penguin.

Yell M, Drasgow E and Rosalski M (1999) Violence in America's schools's legal and disciplinary options, Emotional and Behavioural Difficulties, 4, 1: 19-25.

Zajonc RB (1984) On primacy of affect in: Scherer KR and Ekman P (Eds) Approaches to Emotion, New Jersey, Lawrence Erlbaum Associates.